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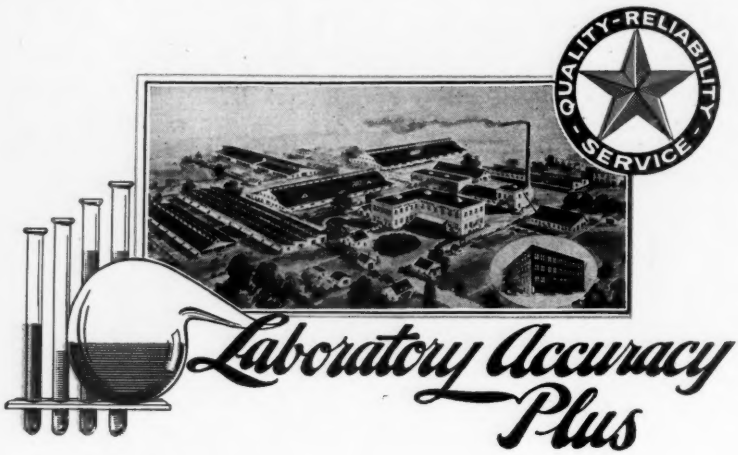

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D. M. Campbell, Editor **A. T. Kinsley, Associate Editor**

Angora goats have proved quite profitable because mohair has been selling at a good price ranging from 50 cents to 75 cents per pound. High class bucks bring up to $500.00.

The first poultry show in the United States was held in Boston in 1849. At this show 1,423 birds were exhibited by 219 exhibitors. The American Poultry Association was organized in 1873. Standardization of domestic poultry was the result of this association.

Rats cost the people of the United States approximately $400,000,000.00 each year. Rats are the principal means of spreading bubonic plague. During the twenty year period ending in 1923, bubonic plague killed 11,000,000 people. There are approximately 120,000,000 rats in the United States, that is one rat for each man, woman and child.

In May, 1918, the tuberculin testing of herds in New York State was begun under the Accredited Herd Plan and in cooperation with the United States Department of Agriculture. On July 1, 1918, 3 herds, representing 192 cattle, were operating under the Accredited Herd Plan: on October 1, 1928, 114,230 herds, representing 1,175,908 cattle, were operating under the Accredited Herd Plan or 64% of the herds and cattle in the State.

It has been estimated that there is an average of 9.2 chickens per farm in Kansas killed annually by automobiles. Thus in Kansas alone, on this basis, 1,526,087 birds are killed each year. The money loss from automobile fatalities of chickens is over one million dollars.—*Poultry Survey* of Kansas.

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600 cases of septic sore throat with 36 deaths occurred in Lee, Massachusetts (population 4,000) during the first two weeks in July, 1928. The infection was traced to raw milk. The epidemic terminated abruptly following the enforcement of a local ordinance requiring the pasteurization of all milk.

The use of ultraviolet light according to Weall of Surrey, England, is of value in live stock production. An experiment was conducted using 24 pigs. Twelve of the pigs were exposed to ultraviolet light for three minutes daily beginning when they were 10 to 12 weeks of age. The time of treatment being increased to 20 minutes. This treatment was continued for 10 weeks.

All of the pigs, 12 treated and 12 untreated, were marketed at the end of the experiment and in every instance, the irradiated sold for a higher price than the untreated. The excess price received for the 12 treated pigs was 14 times more than the cost of irradiating.—*Science.*

Undulant Fever and Pasteurization

THIS disease in man due to infection with the abortion bacillus of cattle or swine or goats, continues to receive a great deal of discussion in medical and public health magazines, and to some extent in dairy publications and in the public press. There is a feeling among some veterinarians that it is receiving a good deal more attention than its importance warrants, and that such publicity may result in harm.

This does not apply to the medical and veterinary press. Members of the medical and veterinary professions may be depended upon to properly evaluate the facts given them, but public health journals and particularly the reports of the U. S. Public Health Service go largely into the hands of the laity and the possibility exists that the danger, if any, from the use of milk contaminated with abortion organisms may be exaggerated in the minds of milk consumers to a degree that harm will result from a lessened use of milk—the most valuable of foods, and the dairy industry be injured through a curtailing of its market.

It has been noted times without number that whenever the public's confidence in the wholesomeness of milk is increased, the consumption of milk rises rapidly. Unfailingly when a city adopts an effective milk inspection ordinance there is an increased confidence on the part of the public in the wholesomeness of the dairy product, and this results in a large increase in the consumption of milk.

The requirement of the tuberculin test for all cows supplying the milk for any given city is always followed by the greater use of milk in that city and it seems only reasonable to suppose that "scare head" articles pointing to the danger of undulant fever as a result of the use of raw milk from infected cattle might result in an unwarranted decrease in the use of milk.

Three causes seem responsible for the large amount of publicity that milk borne undulant fever is receiving. 1, it is a new thing and therefore has news value; 2, its possible importance; and 3, the support that it offers public health officials in their campaign for the universal pasteurization of milk. Public health officials almost as a unit, put in a plea for pasteurization whenever the opportunity offers. No one impunes their sincerity in asking that milk be pasteurized because of the possible danger of milk carrying undulant fever infection or for other reasons. All are in favor of pasteurization, but only as an additional safeguard for milk from healthy animals kept in sanitary dairies. Whenever it is proposed to make pasteurization of milk suffice for the tuberculin test and dairy inspection, its advocates make a mistake.

Milk, even for large cities, can be produced of such high quality that it ordinarily does not require pasteurization. The market milk of Kansas City is an example of this, but even the thorough milk inspection of Kansas City cannot guard against the occasional, one might almost say in time the inevitable, contamination of milk with typhoid or streptococcic organisms of human origin; and for this type of contamination, pasteurization is needed.

Pasteurization fails to give the public a better milk when it is used as an excuse, for permitting grossly and vilely contaminated milk to be marketed provided only it is pasteurized as for example the New York sanitary code. It must not be forgotten that pasteurization itself has its shortcomings. To begin with, it is not susceptible to universal application. Conditions are such that it is not practical to pasteurize effectively considerable part of the milk used in this country, and again pasteurization is not always properly done. The Montreal typhoid outbreak of 1927 is an illustration of this.

The contamination of milk with abortion organisms may be a very important public health problem, but it has not yet been proved that such is the case. The discussion of this question might well be confined to scientific publications until conclusive information on the subject is obtained.

Meeting of the U. S. Live Stock Sanitary Association

THE 32nd annual meeting of the U. S. Live Stock Sanitary Association held in Chicago, December 5, 6 and 7, 1928, was a most successful meeting by every standard of appraisal.

The opening address was made by Dr. Arnold Kegel, Commissioner of Health of Chicago. It will be remembered that Doctor Kegel was appointed commissioner of health while the annual meeting of this association was in session a year ago.

Doctor Kegel spoke briefly of the activities of the health department of the city of Chicago in matters in which live stock sanitarians are concerned, and extended to those present an invitation to visit the health department and call upon them for any information that the department is able to supply concerning its activities.

He mentioned the fact that tuberculosis is increasing among the youth of Chicago in spite of all efforts made for its control. He stated that in an examination of 156,000 school children they had found 71% to have defects that required treatment and it was hoped by corrective measures to raise the resistance of school children to a point where they might be less susceptible to tuberculosis during adolescence.

Two investigators from the Chicago health department who visited most of the countries in Europe where B. C. G. vaccine has been used, found that nowhere is B. C. G. vaccination employed by anyone in authority to enforce its usage. The commissioner stated that 98% of the milk used in Chicago is pasteurized at 145° F., that there is continuous pressure on the Health Department to lower this temperature, and that several times the matter has been up for consideration and each time something has occurred that has made them adhere to the old standard.

The health department is compelled to shut off an average of 100 dairy farms daily from the Chicago milk supply because of insanitary conditions or because of the high bacterial count in the milk.

Thousands of examinations of poultry are made daily and an immense amount of infection found. The commissioner has discovered that he cannot use political appointees for poultry inspection and he is replacing such appointees as fast as possible with veterinarians.

President's Annual Address

President C. A. Cary explained the nature of his annual address by saying that he was no spring chicken, and it might be the last opportunity that he would have to shoot at his fellow workers in live stock sanitation, and he thought it was incumbent upon him to shoot straight.

Live stock sanitation has moved along aggressively during the year, the best example being tick eradication, the reason for this being that we know more about tick fever in cattle than we know about other livestock diseases. The aim in all livestock sanitation is the end attained in tick eradication—elimination of the infection. Tuberculosis we handle, control, prevent, and to a limited degree eradicate, but we don't know enough about it to handle it to the best advantage. We leave infection sometimes in soil, sometimes elsewhere.

Anthrax is a different disease. We can eradicate it in animals, but since the germs live also in the ground the eradication of the disease is problematic. We can't eradicate it by vaccination. We can't eradicate any disease by vaccination. In more than 100 years, vaccination has not eradicated small pox in a single country. Typhoid vaccination will in large measure, prevent the disease, but we can never get rid of typhoid fever by the use of anti-typhoid vaccine, we must clean up and get rid of the infection to be free of the disease.

We don't know anywhere near enough about poultry diseases to do anything worth

while in their eradication, although a good start has been made in the control of bacillary white diarrhea and avian tuberculosis.

The anti-hog cholera work, both research and regulatory, has been as fine as anything that has ever been done in the control of disease, but we haven't eradicated cholera in a single state by vaccination, and we never will eradicate it until we know more about it.

Our experience with foot-and-mouth disease should show us the way in handling other diseases. Eradication, however expensive, is in the long run economical.

In livestock diseases, immunization should be looked upon as a temporary makeshift to be resorted to when we don't know what else to do to earn our salaries.

Perhaps in no other field does politics mix so badly as in the live stock sanitation field. An example of this is one state (presumably Louisiana), that has spent $20,000,000 on tick eradication and only has two or three counties free of ticks. In fact they are just about where they started many years ago, and for this deplorable condition there is not one bit of blame to be placed upon the workers—the responsibility for the waste of public money and of time and opportunity rests squarely upon the politicians. This experience alone is enough to forever indict politics in the live stock sanitation field, but many other examples could be recited. Attempts at mosquito control is another example of the futility of palliative measures. The screens on our windows alone in the main saves us from malaria. Pouring oil upon the waters or filling them with minnows or scattering poison in breeding places have had almost no part in bringing about the decrease in malaria in the southern states. Drainage, and clean up work, the eradication of the mosquito, is all, other than screening, that is worth while.

"I appreciate the laboratory man in the laboratory as much as any one," said Doctor Cary, "but he makes me supremely tired when he undertakes to tell the field man how to do his (the field man's) job." Doctor Cary made a plea that the positions of state live stock commissioner and state veterinarian be taken out of appointive offices by the governor, and the tenure in these positions be made more permanent. "How can a state veterinarian learn his job in a year or in two years? He can hardly learn the A B C's of it in four years."

The speaker stated that the name U. S. Live Stock Sanitary Association, is inept. It is international in scope, an American association and it should change its name to take cognizance of this fact, just as the U. S. Veterinary Medical Association changed its name to the American Veterinary Medical Association many years ago.

STUDIES OF SWINE FLU

By C. N. McBride, Ames, Iowa

Flu is a disease in hogs causing little or no mortality, where good care is given. It is a seasonable disease in that most cases occur in October, November, December or January. Beginning with the onset of cold weather and reaching the peak in December. The death rate is high in hogs sleeping outside in bad weather. The speaker thinks that the sharp lowering in the prevalence of flu in hogs beginning in February and lasting through the spring and summer may be due to the fact that hogs become acclimated to cold weather, but is most likely due to the fact that the large majority of susceptible hogs are marketed by the first of February.

Flu in hogs is an Iowa disease, particularly a disease of Eastern Iowa. Its occurrence is of minor importance outside of that territory. It is easily conveyed by inoculation and by contact, but since a filtrate of the excretions of diseased animals would not convey the disease, the speaker concludes that it is not due to a filtrable virus. The speaker found many organisms present in the nasal and bronchial discharges of affected animals. One organism, a gram positive pleomorphic bacillus, was found in about 60 per cent of the cases, and is suspected of being the cause of the disease.

A. T. Kinsley discussed the subject,

expressing it as his opinion that this organism, the one described by Ray as a diphtheroid organism causing infectious pulmonary edema in swine and cattle, bears a causative relation to flu in hogs. He further reminded his hearers that when flu first appeared in swine a number of years ago that edema of the lungs was the most characteristic lesion it presented and that this pulmonary edema is also a characteristic lesion of fatal cases of flu in man.

STUDIES OF ENTERITIS OF SWINE

By Chas. Murray, Department of Veterinary Investigation, Ames, Iowa

The paper by Doctor Murray was essentially a continuation of studies heretofore discussed in these pages. He finds the suipestifer present in 100 per cent of the cases of necrotic enteritis in swine and has not found it present in normal swine. The presence of this organism unfavorably affects the serum simultaneous treatment. Biologic treatment he finds is not nor cannot be other than an assistant to good sanitation in the control of suipestifer infection. He did not find suipestifer present in any virus on the market either for the vaccination of hogs or for hyperimmunizing.

POST VACCINATION PROBLEMS

By C. A. Cahill, Indianapolis, Ind.

Doctor Cahill thinks that a big gain has been made in the matter of post vaccination troubles in that these troubles are no longer uniformly termed cholera, and while we don't know much about what they are, the fact that we now recognize that in the main, they are not cholera, marks appreciable and very desirable progress in this field.

He stated that most errors in diognosis of post vaccination troubles occur because on autopsy petechia is found. Petechia, of course, should be present in a hog after vaccination, and it is also present in many other diseases. Under such circumstances, it cannot and must not be looked upon as diagnostic of cholera.

To find a more accurate means of diagnosing cholera, the speaker undertook the line of work carried out by Dinwiddie about fifteen years ago, and recently by Shope of the Rockefeller Foundation; that is, a determination of degree of leukopenia present in hog cholera and in other diseases of swine. His findings confirm the findings of Dinwiddie that in the early stages of cholera, 48 hours after inoculation and four of five days before symptoms appear, there is a marked drop in the number of luekocytes in the blood, and the number remains low. In suipestifer infection, hemorrhagic septicemia and some other diseases, there is a marked drop in the number of leukocytes, but these cells increase after 24 to 48 hours, and rise even above normal. The same is true following the serum simultaneous treatment for the prevention of cholera.

After establishing this fact in a considerable number of experimental animals, the speaker tried it in the field in post vaccination troubles, some of which were thought to be cholera and some of which were not cholera, and it didn't work at all. "The result of an attempt to clarify this issue has beclouded it the more," said the speaker.

REPORT OF COMMITTEE ON SWINE DISEASES

By Chas. Murray, Ames, Iowa

The committee finds that changes are occurring in the relative importance of a number of diseases of swine. Hog Cholera is of no less importance than formerly, but a number of other diseases have assumed far more importance than was formerly accorded them. Post vaccination troubles were reported as being less common this year by 84 per cent of veterinary practitioners to whom a questionnaire was sent. In the same questionnaire, 70 per cent of the verterinarians stated that post vaccination troubles were due to complicating diseases and 30 per cent believed them due to the use of insufficient doses of serum; 78 per cent of the practitioners say that

better methods of swine husbandry are employed in their sections than heretofore.

The diseases of swine in the order of their importance are placed as follows: first, necrotic enteritis; second, cholera; third, parasites; fourth, flu.

Bovine tuberculosis eradication is showing a marked effect on tuberculosis in hogs. The retentions of hogs for tuberculosis are 30 per cent less in accredited counties than in the country at large, and condemnations are 80 per cent less in accredited counties. In 1924 retentions of swine for tuberculosis at slaughter were 15 per cent; in 1928, they were 12 per cent. This marks a decrease of 20 per cent in tuberculosis of swine in the whole country. Doctor Connaway, in discussing this report, stated that he believed in revaccination as a practical measure in post vaccination troubles.

STANDARDIZATION OF BACILLIARY WHITE DIARRHEA CONTROL METHODS IN NEW ENGLAND

By W. R. Hinshaw, Department of Veterinary Science, Massachusetts Agricultural Experiment Station, Amherst, Mass.

Doctor Hinshaw gave an account of the conference held at Amherst for the purpose of standardizing laboratory tests for B. W. D. The work of this conference has already been discussed in these pages.

The five laboratories represented at the conference reported the testing of 500,000 chickens, and of these 50 per cent of the flocks revealed no B. W. D. infection. The antigen now used by the New England laboratories is prepared from five cultures, each of the five states participating in the conference, supplying each of the others with its best culture. It was agreed to hold another conference during the coming winter and to invite to it representatives of the Middle Atlantic states in addition to the same New England states participating in the 1928 conference.

THE RESULT OF THREE YEARS' WORK IN BACILLARY WHITE DIARRHEA CONTROL IN VIRGINIA

By I. D. Wilson, Department of Zoology and Animal Pathology, Virginia Polytechnic Institute, Blacksburg, Va.

Three years' work in Bacillary white diarrhea control work in Virginia has shown a decrease in the prevalence of this disease in 80 per cent of the flocks where this work has been carried on, and an increase in the prevalence in 20 per cent. The increase in nearly every instance was explainable by (1) the addition of untested birds, (2) feeding sterile eggs, or (3) bad sanitary conditions.

PRESENT STATUS AND PROGRESS OF THE NATIONAL CO-OPERATIVE TUBERCULOSIS ERADICATION CAMPAIGN

By A. E. Wight, Chief, Tuberculosis Eradication, Bureau of Animal Industry, Washington, D. C.

Doctor Wight distributed at the meeting a comprehensive printed report of the progress in and the present status of tuberculosis eradication work. So much has been given in these pages concerning this work that a further discussion here would be largely repetition, and further, since the report is available on request, it suffices to say that the total number of cattle tested under the tuberculosis eradication plan is now 50,341,073. A toal of 1,556,215 reacting animals have been removed from the dairy and beef herds of the country. This is an average of 3.1 per cent reactors. About eight-ninths of the retesting is now done by approved veterinarians, and one-ninth by bureau veterinarians.

The average percentage of reactors has decreased from 4.9 per cent in 1918 to 2.3 per cent in 1928. The lowest percentage of reactors was found in Arkansas, New Mexico, South Carolina and Tennessee, where the percentage was only six-tenths of one per cent; and the highest percentage in Rhode Island

where it was 14.3 per cent, with Massachusetts 13.2 per cent, and New York with 9.3 per cent third.

The number of accredited veterinarians participating in the uniform plan is 7,097. Of these Iowa has the greatest number, 753; Indiana is second with 522; New York third with 458, and Illinois fourth with 455. Nevada and New Mexico have the fewest, with only 10 accredited veterinarians each, and Delaware has but 11.

In the percentage of modified accredited counties, North Carolina comes first with 100 per cent of its counties accredited. Maine is second with 81 per cent; Michigan third with 67 per cent, and North Dakota fourth with 54 per cent.

The greatest number of reactors, 346,078, have been taken from New York. In this respect Illinois is second with 164,030; Wisconsin third with 136,623 reactors, and Iowa is fourth with 134,922 reactors. New Mexico has had the fewest reactors, 338.

In the number of cattle tested, Wisconsin stands first with 5,225,417; Iowa second with 5,086,093, and Minnesota, New York and Illinois following in order with 3,930,444, 3,734,799 and 3,624,735 tested.

TRANSMISSIBILITY OF BOVINE TUBERCULOSIS TO THE HUMAN

By D. C. Lochead, Deputy Health Commissioner, Rochester, Minn.

Doctor Lochead read a long, carefully prepared paper on the importance of bovine tuberculus bacilli in human tuberculosis. The paper covered much the same ground as that presented by Dr. C. H. Mayo at the American Veterinary Medical Association meeting in Minneapolis last August, which has already been discussed in these pages.

He stated that udder lesions of tuberculosis in the cow is not the usual source of tuberculous organisms in milk. That the percentage of tuberculosis in children and the percentage of tuberculosis in all forms other than pulmonary in adults, is being reduced by the eradication of bovine tuberculosis and the pasteurization of milk; and that in England and Scotland where bovine tuberculosis is very prevalent and where the pasteurization of milk is unusual, the rate for such forms of tuberculosis is enormously higher than for this country, but it is what this country might expect and would have, had it not taken means to prevent it.

LESIONS OF TUBERCULOSIS

By Max Pinner, Director of Laboratory, Detroit Municipal Tuberculosis Sanitarium, Northville, Mich.

Doctor Pinner discussed the reason why lesions of tuberculosis are not found in some reactors to the test. He stated that it takes an experienced man at the Detroit sanitarium two hours to make an autopsy. That obviously, veterinarians cannot take this time to autopsy cattle, and further, that because of the greater size of the carcass, even more time would be required to do the work thoroughly.

He finds that to make a thorough search for tuberculosis lesions in an organ, the organ must be sliced in pieces not to exceed 2mm. (1/12 inch) in thickness, and even when the search is so made, important lesions are sometimes overlooked. He showed slides from the lung of a boy in which the lesions were discoverable only by microscopic examination. This lung had been selected by Doctor Pinner because he wanted a normal lung for some purpose. It was not suspected that the boy had tuberculosis. A microscopic examination showed it to contain millions of tuberculous foci only 1/250 of an inch in diameter entirely undiscoverable except with the microscope.

TWO YEARS' EXPERIMENT WITH THE "CALMETTE METHOD OF VACCINATION"

By W. P. Larson, University of Minnesota, and W. A. Evans, of Chicago

Two experiments under field conditions were conducted by Doctors Larson and Evans that indicated that B. C. G. vaccination is of no value whatever in

preventing tuberculosis infection of cattle, but that vaccination with killed organisms may have some value as a preventive of tuberculosis.

Doctor Evans pointed out that these experiments were made under field conditions and that the outcome is about what might be expected were B. C. G. vaccination to be adopted as a means of controlling tuberculosis. He said that while the outcome was distinctly unfavorable to B. C. G. vaccination, because of the small number of animals used, the question cannot yet be said to be settled.

J. W. Connaway referred to his experience in the use of von Behring's bovo-vaccine more than twenty years ago, and its failure to confer an immunity to bovine tuberculosis infection. Ten calves were vaccinated with bovo-vaccine obtained from von Behring on the occasion of a visit to his laboratory.

A. E. Watson of Ottawa, Canada, in discussing Doctor Larson's paper, referred to his report at the A. V. M. A. meeting, (VETERINARY MEDICINE, September, 1928, page 393) and stated that he had carried on experiments with B. C. G. vaccine for five years, and so far his results had been unfavorable to the use of the vaccine. He stated that for some reason the actual facts regarding the use of B. C. G. vaccine are hidden by a great deal of propaganda. He pointed out that it is not the claim of the originators that the vaccine renders animals immune to the infection but only that it renders them immune to the disease. The vaccinated animal exposed to infection, according to Guerin, becomes an immune carrier and as such is a danger to other animals unless all are vaccinated.

Since the vaccination of all of the animals in the country is a bigger job than testing them, and for the further reason that it would destroy the value of the tuberculin test, the use of B. C. G. vaccination is not applicable to conditions in America. It would, in effect, perpetuate for all time a great reservoir of infection and require universal vaccination of cattle to be continued indefinitely.

UNDULANT FEVER IN MAN

By A. V. Hardy, Acting Assistant Surgeon, U. S. Public Health Service, Iowa Epidemiologist and Acting Director, Iowa State Laboratories, and I. F. Huddleston, Michigan State College

While the mortality from undulant fever in man is low, it is an expensive and distressing disease because of its chronic course. The average duration of illness in more than 100 cases that occurred in Iowa was three and one-half months.

In 1926 undulant fever in the United States was a medical curiosity. In 1927, more than 100 cases were discovered. The number of cases reported in 1928 will probably exceed 500. Throughout the country the occurrence of the disease is directly proportionate to the measures taken for its recognition. No section of the country can be said to be free of it, simply because cases have not been recognized.

Cattle is not the only source of the disease, nor the speaker believes, the chief source; and milk is not the most common carrier. Fifty of 58 farm cases in Iowa were in men, which leads the speaker to believe the chief source of infection is contact with infected animals and not the consumption of milk contaminated by the organisms. It is observed that the porcine strain of the *Brucella abortus* is more pathogenic for man than the bovine strain, but some cases occurring in Iowa cannot be traced to other than cattle as the source of infection. Fifteen cases were discovered among packing house employes and a serum test of 217 apparently healthy packing house employes gave a positive reaction in 29.

I. F. Huddleston of East Lansing, Michigan, in discussing Doctor Hardy's report stated that he had made a study of 220 strains of the abortion bacillus obtained from the United States, Europe and Africa. Eighty-six of 100 strains from the bovine were of the bovine type, 8 were of the porcine type, and 2 were melitensis. Twenty strains obtained from the hog were all of the porcine type. Of 46 strains obtained from man, 21 were

of the bovine type and 25 of the porcine type. Of the 21 bovine type strains, 14 were from Michigan. He has not isolated the porcine type of the bacillus from man in Michigan.

Forty-five strains from man in the Mediterranean countries were all of the melitensis type. Two strains isolated from the horse showed one to be of the bovine type and one of the porcine. Fifteen strains isolated from the goat were all of the melitensis type. The porcine strain is by far the most pathogenic for monkeys. A single feeding of this strain invariably affects the monkey and the disease is always fatal. The bovine is scarcely at all pathogenic for the monkey. It must be fed over a long period to infect this animal, and the disease produced is mild and terminates in recovery. The melitensis strain occupies an intermediate position in its pathogenicity for the monkey.

REPORT OF COMMITTEE ON INFECTIOUS ABORTION

By Ward Giltner, Division of Veterinary Science, Michigan State College, Lansing, Mich.

Dr. Giltner stated that whatever may be our own opinions as to the importance of the abortus bacillus in the cause of disease in man, the fact remains that public health workers and the public in general have been aroused to the danger of milk contaminated with the abortion bacillus and that raw milk from infected cattle will not meet with approval. He recommended that market milk not obtained from abortion free herds should be pasteurized.

He discussed the chaotic condition of the nomenclature for veterinary biologics. He stated that during the year there had been a rise in the amount of abortion vaccines used and a falling off in the amount of bacterins for the prevention of contagious abortion. Abortion serum has been used so little that it need not be taken into account. The use of abortion bacterins, he believes to be futile but harmless. He thinks there is some value in vaccines, but some collateral danger. The committee cannot recommend the use of serums or bacterins and recommends vaccines only for further investigation.

R. R. Birch, of Ithaca, supplemented the report of the chairman of the committee with some recommendations signed by the remainder of the committee. He finds abortion-free herds the most practical, and herds in which all animals are reactors second best. Mixed herds, that is a part reactors to the serum test for abortion and a part non-reactors, make the poorest showing The practicing veterinarian, he believes, is essential to the control of infectious abortion in cattle.

IRON IN NUTRITION

By E. B. Hart, Professor of Agricultural Chemistry, University of Wisconsin, Madison, Wis.

The high point in interest in the meeting centered in the report of research work in animal nutrition by Dr. E. B. Hart. Ever since hemoglobin was known to contain iron, iron salts have been used for the treatment of anemia and for years controversy was waged as to whether inorganic iron salts were absorbed or whether they exercised their beneficial effect if any by preventing the elimination, and facilitating the utilization of iron constituents in the food.

The treatment of anemia with iron has left much to be desired and Prof. Hart undertook some experiments with first rabbits and then rats for experimental animals.

Iron occurs widely in the food. It is more deficient in milk than in any other important food and feeding an exclusively milk diet is the most reliable way in which to produce anemia. Prof. Hart determined that the anemia in rats and rabbits resulting from the exclusive milk diet was not prevented or benefited by feeding pure iron salts, whether organic or inorganic. The soluble salts were no more efficient than the less soluble ones.

It was discovered, however, that if in addition to the iron salts, lettuce or cab-

bage was fed, that the anemic condition was speedily remedied. Reasoning from the analogy in calcium deficiency, which can be remedied by the feeding of calcium only when Vitamin D is included in the regimen or the animal is exposed to ultraviolet light, it was thought that some heretofore undiscoverable vitamin might be necessary to the assimilation of iron. However, the ash of lettuce leaves and the ash of cabbage leaves were just as efficient in bringing about the utilization of iron as was the green plant, thus showing that the essential principal was an inorganic one.

The discovery of the beneficial effect of liver in the diet of persons suffering from pernicious anemia which sent the price of liver up from 10c a pound to 60, 70 or 80c a pound, occasioned Prof. Hart to try this substance on the rats suffering from anemia as a result of a deficiency of iron in the diet. Liver worked equally as well as lettuce or cabbage, and liver ash was just as effective as the raw liver.

A separation of the liver ash, the lettuce ash and the cabbage ash into its various elements, and feeding each demonstrated that copper is the ingredient needed and without it the body cannot make use of the iron salts. In the presence of copper any of the salts of iron speedily relieve anemia due to iron deficiency in the diet.

An analysis of the blood of various animals to determine the hemaglobin level showed that it is very high in babies, and thus babies are provided with a reserve that permits them to live for a long period on a milk diet; but yet babies do suffer greatly from anemia where they are fed milk too long or perhaps from some other causes. In London anemia of babies is a serious public health problem.

Young chickens have a relatively low hemoglobin level, nature apparently expecting them to soon commence picking up food from the ground and thus obtain copper which is widely distributed in nature.

Calves possess a somewhat higher hemoglobin level at birth, and thus are enabled to stand a relatively long period on an exclusive milk diet. Pigs on the other hand, have a very small margin of safety in the hemoglobin level in their blood at farrowing time, nature apparently expecting them to nose around in their mother's feed and pick up parts of food and dirt containing copper at an early date; and this is just what they do. On the other hand, when pigs are confined on floors where they cannot obtain copper from the dirt and where the sows are fed in self feeders or troughs that the pigs do not have access to, the hemoglobin content of the blood speedily decreases below the danger line and the pigs die suddenly from anemia.

The amount of copper necessary to promote the assimilation of iron in the diet is exceedingly small and it is most fortunate that, in the public mind, copper is regarded as a dangerous poison, for that is just what it is. This knowledge of its poisonous properties will probably prevent the public from running to extremes in the use of copper, as they have done in the use of vitamin D for example, an agent generally believed to be harmless, and which the public believes if a little will do some good more will do more good.

A bare trace of copper in the food enables the animal to utilize the iron in its food. Its entire absence prevents the utilization of iron and results in death from anemia.

REPORT OF THE COMMITTEE ON UNIFICATION OF LAWS AND REGULATIONS

By W. J. Butler, State Veterinarian, Helena, Mont.

Dr. Butler reiterated the recommendations made by this committee in the 29th annual report, and reminded the association that state quarantine on interstate shipment has been held by the U. S. Supreme Court to be inoperative where control has been given to the federal author-

ities. He urged that legislative remedies be sought from the Congress to permit the live stock sanitary authorities in the various states to impose such quarantines as conditions demand on live stock coming into the states or unloaded in transit.

REPORT OF COMMITTEE ON RESOLUTIONS

By T. E. Munce, State Veterinarian, Harrisburg, Pa.

The committee recommended that the slaughter of poultry for interstate shipment be placed under the control of the U. S. Department of Agriculture as is the slaughter of other animals.

The commendation of the committee and its congratulations were offered to North Carolina on being the first state to have all counties accredited as modified tuberculosis-free areas.

The committee recommended that the use of the word "accredited" be reserved for animals officially certified to be free from disease and that the name of the disease be included.

A resolution endorsing the Secretary of Agriculture for his action in prohibiting the importation of animals from countries containing dangerous communicable diseases of live stock, was recommended.

All recommendations of the committee on resolutions was concurred in.

REPORT OF COMMITTEE ON TUBERCULOSIS

By C. E. Cotton, Secretary and Executive Officr, Live Stock Sanitary Board, St. Paul, Minn.

The committee recommended that before any farm is certified as being tuberculosis free, that consideration be given to the hogs on the farm.

It further recommended that following July 1, 1931, the uniform regulations for the control and eradication of tuberculosis be changed to require that feeder cattle shipped into a modified tuberculosis free area be subjected to the same regulations as dairy cattle.

The recommendations made were concurred in.

REPORT OF COMMITTEE ON MISCELLANEOUS TRANSMISSIBLE DISEASES

By A. W. Miller, Assistant Chief, Bureau of Animal Industry, Washington, D. C.

This committee reported that the United States has been free from foot-and-mouth disease for three years, and that all the countries reported by the committee one year ago as containing foot-and-mouth disease, still contain it.

A new development in the control of this disease is the discovery of bichlorid of mercury is ineffective against the foot-and-mouth disease virus and not a suitable agent for use in disinfecting after the occurrence of the disease.

The glanders situation is satisfactory, there being very little of this disease in the United States.

Hemorrhagic septicemia continues to cause a heavy loss. The situation is about as previously reported.

Election of Officers

The election of officers for the ensuing year resulted in the selection of Charles G. Lamb, state veterinarian of Colorado and one of the organizers of the association, for president. His name was placed in nomination by State Veterinarian Williams of Texas, in a typical oratorical effort during which attention was called to the scintillating halo above his head, and the pinions sprouting on his shoulder blades. Healy of Wisconsin gilded the lily that Williams had painted in a seconding speech and the election was by acclamation.

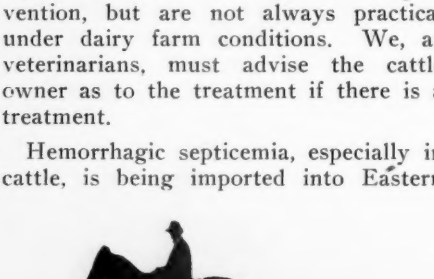
With this start, the pyrotechnics were on and Butler of Montana, Munce of Pennsylvania, Fitch of Minnesota in turn presented to the Association, A. E. Wight of Washington, D. C., J. M. Whittlesey of Hartford, Connecticut, and W. G. Hollingsworth of Utica, New York, for first, second and third vice presidents. The election in all cases was by acclamation. The Executive Committee re-employed O. E. Dyson of Wichita, Kansas, as secretary-treasurer.

Veterinary Conditions in Eastern Iowa*

By A. R. MENARY, Cedar Rapids, Iowa

ABORTION disease in cattle is becoming a great menace to the dairy cattle industry. It is doing greater harm than any other one disease. Neighboring veterinary practitioners are giving conflicting advice as to its treatment. Neither can say that he is right. If veterinarians continue to differ on abortion disease of cattle, then, of course, we must expect the cattle owner to lose confidence in our judgment. Isolation and sanitation are, of course, the best prevention, but are not always practical under dairy farm conditions. We, as veterinarians, must advise the cattle owner as to the treatment if there is a treatment.

Hemorrhagic septicemia, especially in cattle, is being imported into Eastern



Iowa with a great many carloads of cattle. This disease has caused a great loss to cattle feeders. Hemorrhagic septicemia appears in so many and varied forms that it is at all times baffling both to the veterinarian and cattle owner. Treatment like that for contagious abortion is of questionable value. A great deal more study of this disease is necessary by the practitioner so that he may be better able to save his client from financial ruin. The interstate shipment of cattle infected with hemorrhagic septicemia, or cattle from infected yards should be stopped by our state authorities, or some method of compulsory vaccination and quarantine be promulgated so that native cattle may be protected from infection.

The ten most prevalent infectious diseases of Eastern Iowa live stock reported by veterinary practitioners to the publicity committee of this association during the past year, are, as follows:

Hog cholera, hemorrhagic septicemia of cattle, blackleg of cattle, necrobacillosis of swine, flu of swine, hemorrhagic septicemia, or fowl cholera, of chickens, contagious abortion of cattle, influenza of horses, hemorrhagic septicemia of swine, and sclerosteniasis of colts.

The members of this association would benefit, as would their clients, if you practitioners were more diligent about reporting to the publicity committee of this association infectious diseases of live stock that are of public interest.

More than twelve county organizations of veterinary practitioners have been formed in Eastern Iowa during the past year. This is a great step forward and should be of immense benefit in harmonizing and advancing the interests of our profession and of the live stock industry.

The work of our publicity committee should be continued. A committee on policy should be appointed whose duties should include travel to different points on occasion to interview practitioners who violate the code of ethics, and to help those practitioners who are experiencing interference with their livelihood by reason of violation of the veterinary practice act and serum-virus control act of this state. The members of this committee should be able and active men whose interest in our profession and our association is unquestioned.

* Excerpts from the President's Address at the Annual Meeting of the Eastern Iowa Veterinary Medical Association, Cedar Rapids, Oct. 17, 1928.

New Eating Habits for Old

By HELENA L. WILLIAMS

TWENTY-FIVE years ago it was commonplace for a business man to eat three hearty meals a day; including, perhaps chops for breakfast, steak for lunch, roast beef for dinner. Also, twelve course dinners and heaping portions were the ideal of the perfect hostess.

Those were the good old days when waistlines were a merely feminine problem and male pauches were an indication of prosperity.

But the day of overstuffed bodies has passed. Nowadays doctors recommend a moderate diet with meat not more than once a day, and it is not unusual to see men of affairs eating a bowl of milk and crackers for lunch. While children should be encouraged to maintain a weight slightly above the average, for healthy adults past forty, a few pounds under the average or "normal" weight provide the "margin of safety."

The change has come about for several reasons. We have acquired a wholesome dread of overweight. Overweight is useless baggage. It may bring on a high blood pressure for one thing, which in turn may cause a serious heart condition and other ailments. Then, too, surplus weight is like unburnt carbon which clogs the cylinders. We have found that overeating causes mental sluggishness. And in this age of high-pressure business methods, no one can afford to be so handicapped. Moreover, the average business or professional man takes less exercise than he needs, so that his body does not require as much fuel as that of the physically active person.

Nutrition experts agree, however, that many of us do not eat well-balanced meals. In recent years they discovered that leafy green vegetables are of vital importance in the human diet, and it has become a hard task to make the public appreciate this fact. Vegetables such as cabbage, kale, string beans, celery, spinach, beet greens, dandelion greens, turnip greens and water cress are called the "protective foods." They contain the vitamins that are essential for growth and that protect against certain diseases such as rickets, scurvy and pellagra. Vitamins also help to keep bodily resistance against tuberculosis at par. It is not impossible to have fresh vegetables even on the table of the city family, for with modern transportation and refrigeration they are obtainable the year round.

Starchy foods are also essential, though potatoes, beans, spaghetti, and cereals should not outbalance green vegetables. The so-called "tubers," including carrots, beets, turnips and other root vegetables should also be included. And fruits are far more valuable than sweets, of which Americans, by the way, eat a vast quantity. Recent figures show that we consume about 100 pounds of sugar per person per year, or about one-sixth of our daily energy supply. "This" says *Food, Nutrition and Health,* "crowds out an equivalent amount of the food which, if used instead of sugar, would supply all the things in which sugar is lacking. Sugar contains no structural materials, no vitamins and no mineral elements."

Public education in a healthful diet is one of the activities of the National Tuberculosis Association and its affiliated organizations which are conducting the twenty-first Christmas Seal Sale in December. Buy Christmas Seals. Use them on all your correspondence during the Holiday Season.

Personality in Business*

By J. L. McKILLOP, Selma, California

WEBSTER says of personality that it is personal existence or identity; it is that which constitutes distinction of person, distinctive personal character, individuality; that it is the quality or qualities of a person constituting or fixing his state. Two general ideas emerge from the above. First, the personality of an individual is what makes him different from other individuals. Second, It includes all the qualities that help make him an individual.

In our customary associations and dealings we make no such classification but each party to a social contact accepts the other as a whole without considering the elements in his makeup.

Importance of Personality

That makeup, however, is of consummate importance, because it never fails to leave an impression of some sort after every contact. Since our lives are made up of myriads of contacts and are determined by their results, and these results, in turn, flow from the interchange and interaction of personalities, it naturally, even inevitably, follows that personality takes a place of first importance in these days of crowded populations.

So decisive, indeed are our contacts that their nature forms one basis for classifying vocations. Contactually all occupations divide into the social and the non-social, and one's choice among them rests largely upon the degree to which the social predominates in his temperament.

Social occupations are those in which social graces play a part that always is important and sometimes is dominant. The minister cannot succeed without these graces, the small scale merchant is lost without them, the lawyer is handicapped in their absence, the doctor smoothes his pathway by exercising them, public service employees enhance their value by practicing them, and they are the veritable stock in trade of public officials. Clerks too, must display them with their wares or they make no sales. They are essential in many callings to start and establish one in his career. If a doctor, for instance repels or antagonizes by his manner, his skill is lost because he will have no patients. A practitioner of proved skill and established reputation can perhaps disregard social contacts and be just as fully a musty old, fusty old, crusty old codger as disposition and digestion incline him to be, or he can shut himself away from the world and devote himself exclusively to his study and his practice, but the beginner cannot. His living enlarges as his circle of acquaintanceship grows. The engineer is not so dependent on these relationships, nor the public accountant, nor the day laborer, nor a host of other sorts of workers.

I have developed this topic thus at length to illustrate and establish the truth of the contention that personality is of decisive weight in the selection of a calling as well as in its pursuit. At the very beginning of one's vocational career it rightly determines the course of one's efforts, during the career it swings the balance to success or failure, and at the end of active life it is seen to have been the decisive element in the individual's measure of accomplishment.

No one can get away from it. It expresses itself constantly, doing so consciously as one works, either intelligently or unintelligently, upon the unfolding of his powers, and unconsciously at all other times. For the majority of us, this latter is during most of life.

Personality Influences Results

It will, therefore, be readily seen that personality influences results. It not only has a part in salesmanship but in a very real sense *is* salesmanship. Only a part of the process of selling, selling one's skill, or one's wares, or oneself, is art; much of it lies outside of art. Besides, in such matters, even

*Read before the San Joaquin Valley Veterinary Medical Association.

the art of the process is largely expression of personality.

We all recognize the efficacy of good dress and pleasing address in salesmen. The man who shambles unannounced into my office when some one else has my ear, who leaves his hat on his head or dumps it indiscriminately in the way, must have an extraorinarily meritorious article in order to make a sale in the face of such initial handicaps.

Platform effectiveness is only partly what the speaker says and the literary force of the way he says it. It is much more in himself, his voice, his facial expression, his bodily carriage, the impression he gives of sincerity; these intangibles that become tangible in what we call platform personality. To sway readers is one thing; to sway hearers a very different thing. With his charm of manner, Henry Clay moulded his audiences almost at will, but who reads his stuff? Daniel Webster was one of the few whose speeches command both readers and hearers. Edmund Burke's orations are wonderful to read, but when he spoke them he put his audiences to sleep. With his high, squeaky voice, and the nearsightedness that compelled him to wear thick glasses, and his habit in reading his manuscript of holding it so that his face went into total eclipse behind it, he could not retain the attention of his hearers.

Is Personality Cultivable?

Definitions of instruments of service, of agencies of contact, are of little benefit unless they lead to usefulness. It is not of much use to know what items enter into personality if such knowledge serves only for identification. This discussion leads directly to the question: "Is personality cultivable?" If heredity completely closes "the gate of gifts," if personality is something that for each of us is permanently fixed at the start and incapable of being directed or developed, then such studies as this are merely pastimes, no more than socially dissociated and valueless intellectual curiosities.

I do not believe this to be the case. Personality starts with hereditary endowment but may be indefinitely unfolded. It is static, becomes a "frozen asset" only at will of the individual. Its study is hence of really vital moment and is one basis of social and, by consequence, of business or professional progress.

Cultivable Attributes

The elements of personality are, physique, mentality and temperament.

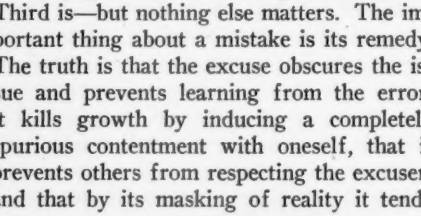
We are all familiar with many possibilities of improving nature's gifts in physique. The same is largely true of mentality. Our whole educational system is an acceptance of the responsibility nature thrusts upon us by starting us out without mental skill. But because we have not given the matter analytical attention, we are much less familiar with the far reaches of temperamental training. Temperament is a matter of attitudes. Modifying them is essentially and simply only allowing judgment to rule sentiment, permitting reason to reign over impulse. It raises man from the realm of animals who respond almost exclusively to the "monotonous excitations of sexual and physical appetite" to the plane of a being with responses of almost infinite variety.

Some Attitudes That Can Be Developed

By way of illustration I shall now name certain items of temperament that can be modified or cultivated.

Among these is certainty. There are those who weaken themselves by never *knowing* anything but habitually only timidly *thinking* it. Distrusting themselves, they cannot instill confidence in others. I do not for a moment advocate the silly and blatant positiveness that arises from egotism. That is at once recognized wherever exhibited and immediately appraised at its true worthlessness. But when opinion or action arises from knowledge, there is no reason for hesitancy. A justified self-assurance begets confidence in others and paves the way for achievement. As knowledge grows, self-assurance keeps pace. An allied quality, often times a derivative from self-confidence, is persistence. It thrives and enlarges as conscious attention is given it. Its value is too obvious to require further attention.

Pride is another cultivable attribute; pride that is not empty conceit but that is dignified and respectful of self, that neither cringes nor is weakly or unnecessarily apologetic, and that disdains excuses. Excuses are one of the sins of the age. They have come to be a distinctive characteristic of large groups of our population. One would think from the customary procedure of such groups that the excuse is the most important thing about an error. Of second importance is the scapegoat to whom to "pass the buck." Third is—but nothing else matters. The important thing about a mistake is its remedy. The truth is that the excuse obscures the issue and prevents learning from the error, it kills growth by inducing a completely spurious contentment with oneself, that it prevents others from respecting the excuser, and that by its masking of reality it tends



to develop a general cynicism. This is a heavy indictment of the excuse, but is justified if one is to avoid its negative effect upon the unfoldment of his personality.

May we not include language as another cultivable constituent of personality? If not an actual constituent, it is certainly a medium of its expression and just as certainly may be developed by attention.

In these days of specialized training and effort, the possession of professional spirit is of extended value. If your occupation is honorable and useful, if it gives adequate returns to those who practice it, if its worthy followers are respected, and if it has a reputable body of specialized literature beyond the compass of any one man to master, it is properly termed a profession and rightly demands professionalization from its devotees. Media of this process for the individual are: protracted and special training, membership in local and general organizations in the calling, attendance upon meetings of such organizations, participation in their programs and routine functions, acquaintanceship with other practitioners, courses of reading, and identification publicly and socially with the vocation. The occupational union, if truly professional, is strictly a monogamous affair. A calling is a jealous mistress. In a really professional relationship it will have exclusive claims upon one's esteem, it will have first place in one's reading, and it will have an almost if not quite exclusive place in the hours of one's productive labor. One cannot now carry a profession as a side line and be long either effective or reliable. It is "whole hog or none." Specialization brings success and is requisite to it.

Capitalizing Social Contacts

In the process of capitalizing social contacts, there is probably no single element so efficacious as courtesy. It is also probably true that no single element is more capable of being nourished. Courtesy as a matter of observance of formal practices has its value but is neither inherently an element of personality nor especially worthy of protracted study. It can be learned in a comparatively few hours. As the expression, however, of an inner attitude of sympathy, interest and considerateness it is a social lubricant of prime effectiveness. It must be sincere, not in the least affected or condescending, a natural working out of genuine fellowship. As such it mellows austerity, it opens the door to friendship, it multiplies acquaintances, it enhances professional standing, it makes repeaters of customers or patrons, it covers a multitude of deficiencies, it throws a warming halo of geniality about an otherwise ordinary and distant human being. Its cultivation is worth every effort.

Transferred from individual to group contacts, this same spirit will lead to participation in community enterprises. The man who thus participates to a natural degree as his circle enlarges and his interests grow, will become a community asset and

find community acceptance. If he forces such connections he will find himself considered a "joiner," who is actuated by ulterior motives. Influence is not exerted by fiat nor is leadership often secured by being sought. They arise from spontaneous adoption of suggestions or the equally spontaneous imitation of actions and not because one wants leadership. "Joining" for policy's sake is sterile, doing it as an expression of interest and for the sake of service is productive.

Considered from this viewpoint, conformity to the best in the social standards of one's community is still another method of personal adaptation to environment.

Summary

If my line of reasoning in this paper has been correct, personality richly repays study because it richly responds to treatment and is capable of modification and adaptation limited only by one's enlightenment, ambition and persistence. It is further true that after the initial study and the setting of objectives the personality is most fruitful that most sanely becomes unconscious of itself and merges itself into the interests of those whom it serves.

DIETARY DISORDERS IN POULTRY

I wish you would submit the following question to your poultry department for diagnosis.

This particular flock of chickens has been affected with a sort of paralysis every year for five years or more. Some are lame for a few days before going down, and some go down suddenly out of apparently the best of health. Some become emaciated while others remain in good flesh and even sing and lay after becoming helpless.

Outside of a few round worms they show nothing on postmortem examination. None of those affected ever get well and not many are affected at any one time.

During the course of a year they lose approximately one-third of the flock. Any assistance which you may offer will be highly appreciated.—C. B. O., Ohio.

Reply: There are several factors that cause or contribute to the condition mentioned, and of course it is impossible to make a positive diagnosis unless the poultry plant could be visited and first hand observation made.

The first thing that I would advise in conditions such as this, is to have a careful microscopic examination made of the feces of these birds and see if there are any coccidia present. If so, I would advise a change of runs, thorough and frequent cleansing of houses, feed and drinking troughs and free use of disinfectant sprays. Regulate the diet, care being taken that they are not fed too heavy or fed too much. Also that the diet is adequate and is not deficient in any way. Buttermilk makes an excellent food and aids in control of most intestinal disorders. Dietetic errors are frequent causes of such outbreaks.

A too heavy diet, especially one containing large amounts of commercial beef scrap is a common factor. Diet deficient in certain elements especially green food, minerals, etc., and that contain too little beef scrap or its equivalent, the opposite of the first named dietetic irregularity, are often important factors in causing such conditions.

Oftentimes some irregularities in feeding and coccidia go hand in hand in producing the condition named. Intestinal parasites are frequent causes but I hardly think this the trouble in the above mentioned flock as they were found in such limited quantities.

In concluding, I would summarize the steps advisable in such conditions, as follows:

1. Have an examination made for coccidia.
2. Regulate diet if it is not right.
3. Thorough cleaning and disinfection.
4. Regulate any other errors of mismanagement that come to notice.
5. If practical, under existing conditions, rotate runs.—F. D. P.

BULL FAILS TO BREED

I have a pure bred Guernsey bull in my district that presents a rather peculiar condition and I would like your opinion about him.

This animal is three years and six months old and has some very fine stock progeny. About nine months ago the herdsman noticed he was not giving proper service but managed to get a couple of cows in calf some six months ago. I was called to see him last week.

The animal is in perfect condition so far as flesh is concerned, not too fat and not too thin. Has been out on pasture daily all summer, receives a grain ration twice daily of oat and barley chop, and as far as I could determine, there is no chance of deficiency in the diet.

As one of the cows was in season, I suggested they let me see him perform. Now to make it plain, he simply got on the cow, protruded the penis six or eight inches and then comes off and in a very short time repeats the action. He simply fails to make the final jump and properly enter. Seems to have plenty desire but cannot accomplish the act desired. I examined him as carefully as I could but could find nothing wrong, no swellings, or enlargements, testes normal, prostate gland normal, no soreness, etc.

This herd has had considerable trouble with abortion, and I was wondering if there could possibly be adhesions between the penis and sheath though I have never met with any trouble of that nature. The bull has no discharge and never has had so far as the owners know.

Your opinion on this animal will be greatly appreciated.—H. R. McE.

Reply: Not having examined the bull and basing my opinion on your thorough description, I would suspect that there is some soreness in the penis from an injury of some character or that there are adhesions that you cannot get your finger back far enough to locate. Let it be as it may. You are practically helpless. Probably the only thing that you can do is to give the bull sexual rest.

On general principles, I certainly would try to get some semen and examine it. You may have to get this by massaging the seminal vesicles. Now the thought may occur to you, that it doesn't matter much about the semen if he does not eject any. That's true but if you should find that the semen is laden with pus, it would indicate a deep seated infection that may be occasioning his trouble but if you can eliminate deep seated infections, it will be somewhat of a guide as to the prognosis. In other words, if there are no extensive adhesions, but just soreness enough to discourage extreme erection, it is reasonable to suppose that in time this will pass away. It might be well to paint along the line of the penis with iodin, of course there is a question whether it would have any merit, but it might keep your client, if he is that sort of a client, from fussing with other things. We know that counter irritation relieves soreness and you might just hit the right spot with the iodin.

To illustrate how incomplete the history of such cases may be, I recall being called in consultation a few years ago to see a valuable Jersey bull. The veterinarian reported by telephone that the bull had been in great pain for several days and that it appeared like urine oozing through the skin in the region of the genito-urinary organs. I arrived at the veterinarian's home that evening and next morning we went to the farm. The bull was then in a comatose condition, probably suffering from uremic poisoning, so we slaughtered him and held an autopsy. We found the bone in the penis crushed and the end of the penis bent back indicating that there had been efforts of erection soon after the bone was fractured, causing a doubling over in the sheath. Taking in the surroundings, it seemed quite probable that the way the penis had been fractured was by a kick from an attendant. If erection had not taken place too soon, that is, before soreness had set in, the probabilities are that the bone would have remained in position and in due time healed, or if the

sheath had been cut into and the condition discovered early, had it seemed best, destruction might have been advised early enough to salvage the carcass.

I shall be glad to hear from you later as to how your case comes out.—J. F. DeV.

SUDDEN DEATH IN PARTURIENT PARESIS

Today I was called to a milk fever case. The calf was four days old (her sixth).

History: This cow, a large Guernsey, had been down since last night. The owner, on my arrival, was endeavoring to drench her with salts, which killing procedure I stopped at once. Everything was exceedingly handy and as I saw, quick action imperative (with five neighbors to help me). I allowed two others to milk her out for once. To my great surprise, each one of her quarters required but little inflation, promptly getting hard. She was then on her left side, and got into a comatose state before inflation was finished, I noted it (the sleeping condition) beginning while she was being milked out. There was no apparent absorption of air while inflating the udder, which on completion caused returning consciousness and disappearance of the "snoring," causing all hands around to observe that she was "getting better."

As usual, I avoided sucking over food into the lungs by quickly setting her up on the sternum and proper elevation of the head. In that position she ate hay, dying after eating a dozen mouthfuls. As she had laid on her left side all night, I expect hyperemia there, but what cardiac trouble was this?—A. M. L., South Carolina.

Reply: You do not state how soon the cow died after you saw her. It would seem likely that it must have been some time afterwards, since she had recovered sufficiently to eat hay. Another important thing not mentioned is whether or not she struggled a good bit before dying.

I think you know that I have repeatedly pointed out, both in speaking at meetings and in writing about milk fever cases, that we must always guard against the animal attempting to rise or move about too much until the heart action has had time for adjustment, so to speak. I have likewise emphasized the necessity of a prompt heart stimulant as well as a regulator as a routine procedure in the treatment of milk fever. So far as I know, there is no other heart stimulant listed in the pharmacopoeia that gives such immediate results does as strophanthus; hence for years we have made it a practice to give a dose of strophanthus, digitalis and nux vomica to all milk fever cases the minute we see them.

I have seen and I am quite sure that other country practitioners have seen, cases of milk fever that had been neglected and quacked with, as was your case, until the heart beats have almost stopped. We would hurriedly inflate such cases (after we had learned that that was the treatment that gave results); the patient apparently making a nice recovery, possibly rolling upon to the sternum of her own accord, but if annoyed by a dog or some injudicious person attempting to get her up or move her to some more comfortable quarters, she suddenly passed out. I have often compared the danger of moving milk fever cases in the cow to that of moving a horse during the acute stage of azoturia. We really cannot warn the inexperienced too often against the danger of this procedure. Many, many cases that might have made a fine recovery have surely been killed this way. So to repeat, since we have been giving our heart stimulant and guarding our cases from injudicious handling, we have not suffered the disappointments that we did formerly.

There is another danger that must be taken into account, and on which the textbooks are, so far as I know, silent, and that is foreign bodies. Within the past month I have been called in consultation on two occasions, to see valuable

cows that apparently calved normally, but a day or two after calving, showed marked digestive disturbances of a character suggesting traumatism, while not typical, the history and symptoms would justify such a diagnosis. Both of these cases happened to recover but we have seen similar cases grow worse and die. This traumatism is occasioned by the act of parturition; the foreign body or bodies probable lying benignly in the reticulum until muscular pressure at the time of parturition forces this organ ahead with the result that the foreign body penetrates the walls of the digestive track and may or may not penetrate the pericardium and the heart proper. The extent and character of the injury of course, determine whether the patient recovers or dies.

In the case of death under such circumstances, it is always well to hold an autopsy and I rather suspect in your case that had you done so, you would have found the offending agent. I recall a case simulating very much the one you describe and on autopsy, a rib of an umbrella was found protruding through the reticulum, the pericardium and heart muscle. It was evident from the appearance of the rib that it has been in the animal's stomach some time and maybe have gone on to dissolution had not the act of partrition changed its position.—J. F. DeV.

A TWENTY-SIX-YEAR-OLD DOG

In the November issue of VETERINARY MEDICINE mention is made of Dr. Pammel's dog which died at the age of 22 years. A dog, recently buried in our dog cemetery, lacked only 15 days of being 26 years old at the time of its death.

"Teddy," as this dog Methuselah, was known, was a fox terrier. During the last years of his life, "his health was good but he was blind and deaf, had only one tooth in his mouth and experienced difficulty in walking."

He belonged to Mrs. R. W. Hayward, 12903 Thornhurst Avenue, Cleveland, Ohio. W. C. Woodruff.

STYFSIEKTE IN CALVES

What causes two or three month-old-calves to stiffen up in front, and behind? There is some tenseness and swelling in the glutial muscles; pulse, respiration, temperature, feed, and condition normal. Occasionally there is posterior paralysis and atrophy of the parts.—E. E. H., Ohio.

Reply: Because of the fact that the pulse, respiration and temperature are normal in the calves in question, it would seem very probable that the condition is of dietary origin. The paralysis you mention may be induced by phosphorous deficiency and it might be advisable to use some good mineral preparation in the calves' feed.

Somewhat similar conditions result from lack of forage (roughage) in cattle, but the onset is, so far as experiment has shown, at a much later date than three months of age.—A. T. K.

GARBAGE FEEDING OF SWINE PROFITABLE

Noting that you have a special on Swine Practice for October 1928, I fail to see any mention of garbage feeding in it, a subject I have carefully and persistently worked on for a number of years, and have today five process patents pertaining to the salvaging and increasing the food value of hogs feeding, namely a process patent for pressing and removing the foul juice, the magnetic metals and tin cans and last and most important, the sweetening it with a non-irritable, quick lime iron dust which of course, does wonders and is cheap and easily made.

It first absorbs moist suspended sour odor, prevents formation and elimination of odors, increases the food value, increases the fertilizer value, prevents corrosion of metallic cans and containers, prevents diarrhea in hogs, prevents the formation of soft pork and aids in the growth of a hard solid white perfect bone.

Garbage disposal is really a veterinarian's job since the only way to dispose of it is by feeding it to hogs.

St. Louis, Mo. Edward H. Brune.

Common Intestinal Parasites of Poultry

By F. D. PATTERSON, JR., Auburn, Alabama
Veterinary Department, Alabama Polytechnic Institute

THE problem of controlling intestinal parasites of poultry is a very important one. As poultry production increases, bringing with it more large flocks, crowded quarters, contaminated soil, and many other unnatural conditions incident to the installation of artificial methods that are so necessary to mass production, the importance of the above problem becomes correspondingly increased. We must, however, guard against the practice of accusing these parasites too often; for, while intestinal parasites are potent factors in producing symptoms of disease, at the same time weakness and disease are very inducive to parasitism, so that we often make the error of diagnosing parasites because of certain indefinite symptoms or because parasites happen to be present on autopsy. Of course, whenever parasites are present we should eradicate them as far as practicable, regardless of what the principal cause of the existing disease may be. Attention is called to this error because it often prevents the finding of other, and sometimes more important, disease-producing factors.

Poultrymen of today are very much inclined to make an unwarranted diagnosis of worms on the slightest provocation and institute medicinal treatment, usually neglecting the more important hygiene and sanitary measures. In such cases they invariably neglect to have a positive diagnosis made, because of the firm belief that intestinal parasites are the sole cause of the trouble. Fortunately if the necessary hygiene and sanitary measures are practiced, a major step is instituted in controlling any disease, so that when a diagnosis of parasites is erroneously made the error is to a large extent taken care of. The poultryman, however, depends too much upon medicinal treatment and too little upon hygiene and sanitation.

The three principal types of intestinal parasites are:

1. *The Large Round Worms, Heterakis perspicillum.* They infest the small intestine. The general outline of this worm is cylindrical, but they are attenuated at both extremities. The female is larger than the male. These worms are from one and one-half to four and one-half inches in length. They are white or yellowish white in color. The sexes are separate. These worms are found free in the small intestine, but may sometimes be found out of their natural place of habitation. They receive their nourishment by ingesting the food of the host after it has been prepared for absorption. They are not blood suckers.

Life history: The female deposits fertilized eggs in the intestine of the host, these eggs pass out to the ground in the droppings, where they undergo a certain amount of development. After the necessary outside incubation period the eggs are ingested by the host in contaminated food and water. The eggs hatch in the host and the young parasite takes up permanent abode within the lumen of the small intestine. Infestation is direct, as they do not have an intermediate host. These parasites are comparatively common and are the most important intestinal parasite in this section of the country.

Effects on host: There are three ways by which these parasites produce their harmful effects upon the host:

a. By depriving the host of much of its nourishment.

b. By the elimination of a toxin.

c. By mechanical irritation, and sometimes mechanical obstruction. At times by reflex action.

There are no specific symptoms that we can depend on for a positive diagnosis. The

most characteristic symptoms are: anemia, emaciation, weakness, irregular appetite, diarrhea, paralysis, blindness, vertigo, etc. As the above symptoms may occur in so many other diseases they can not be depended upon as a sole means of diagnosis. The most satisfactory method of making a positive diagnosis that these worms are the principal cause of the existing disease is to autopsy one or more affected birds and be governed by history symptoms and lesions found on autopsy.

2. *The Small Round Worms, Heterakis papillosa.* This is a very small round worm measuring less than an inch in length. These little parasites infect the ceca, where they are found unattached, either lying on the mucosae of the ceca or in the ingesta. They are most frequently found in the blind end (apex) of the ceca, and can often be seen better through the wall by holding the ceca up to the light than they can after incision, especially if the ceca is not full of ingesta and contains much gas. These are perhaps the most frequently found of any of the intestinal parasites and the least harmful in their direct effects. The cecal worm is said to be the intermediate host of the protozoan parasite that produces infectious entero-hepatitis (Blackhead) in turkeys. As a rule, the direct harm done by these parasites is negative. Their life history and general habits are similar to those of the *Heterakis perspicillum,* described in the foregoing.

3. *Tapeworms.* There are at least six species of tapeworms that infest poultry, five of which have been positively reported as occurring in the United States. Among the most prominent are:

a. Choanotaenia infundibuliformis. The common housefly, *Musca domestica,* is the intermediate host that harbors the cysticercoid.

b. Davainea tetragona. This taenia produces a nodular condition of the intestine known as nodular taeniasis.

c. Hymenolepis carioca, a delicate taenia.

d. Davainea cesticillus. Another delicate tapeworm.

Coleopterous and lepidopterous insects, also certain snails and other crustacea, are said to be the intermediate host of many species of tapeworms, but positive accepted proof is wanting so far as the specific host of the last three are concerned.

Tapeworms are segmented parasites and represent a very low form of animal life, parasitism being well developed. These parasites are hermaphroditic, each segment containing a complete reproductive organization.

Tapeworms are attached to the mucosa of the small intestine by means of hooklets that protrude from their rostellum. This attachment is not for the purpose of obtaining blood, for they are not bloodsuckers, but only for the purpose of maintaining their position. Tapeworms live on the food of their host by absorbing it through their segments.

Life history: As the posterior segments mature they become detached and pass out with the droppings; after they reach the ground the eggs are set free and are taken up by their respective intermediate host, where the cysticercoid develops. Eggs are frequently set free before they pass to the ground. The intermediate host with its contained cysticercoid is ingested by the fowl, the cysticercoid is then set free and develops into a tapeworm in the small intestine.

Effects on the host are not far different from those produced by the large round worm, diagnosis is made in a smiliar manner.

Control

The most important control measures for all internal parasites of poultry are sanitation, such as rotation of yards, ploughing or spading yards, planting green cover crops, sunshine, cleanliness and disinfection of houses, the droppings should be removed from poultry habitations and should not be placed on soil used for growing poultry foods, especially green food. Lime scattered over the yards is beneficial. The eggs of parasites are very resistant to external influences and may remain alive in a dormant state for a long time, becoming active as soon as conditions become favorable. Hygiene and sanitation are by far the principal and most important control measures to be

carried out, especially so until some better flock treatment than we have at present is worked out. Rotation of runs is indispensable in many instances.

Medicinal Treatment

Tobacco dust, using two pounds to each 100 pounds of mash, this medicated mash to be kept before the flock for a period of thirty days. A dose of Epsom salt dissolved in drinking water should be administered at ten-day intervals during this period. The tobacco dust treatment will aid somewhat in controlling intestinal parasites. Another method of administering the tobacco is to steam one-half pound of tobacco stems and mix with a moist mash. This is the proper dose for fifty birds and should be administered after fasting the flock for twenty-four hours. This should be followed by a dose of Epsom salt.

Turpentine in from thirty to sixty minim doses incorporated in one teaspoonful of castor oil is a very effective individual treatment to remove round and tape worms.

Kamala is given a very high rating by Dr. M. C. Hall as an effective anthelmintic to use in the eradication of tapeworms. Fifteen grains in capsule is recommended for adult chickens and 30 for turkeys.

Iodin vermicide, a new preparation that was worked out by Chandler, very effectively removes round and tape worms.

Reinfestation occurs in about six or eight weeks, according to our observation on one test of 1,000 birds. It is doubtful if routine individual medication is practical, but in some instances such medication undoubtedly has a place.

Keeping up the resistance of the host by proper feeding, etc., is of prime importance. A healthy individual goes a long way toward throwing off intestinal parasites. Too little attention is paid to the resistance of the host. —*Poultry Item.*

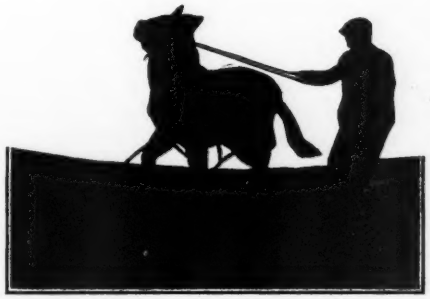
Toe pecking in chicks is probably caused by lack of animal food and inactivity. The use of one level teaspoonfull of salt to a gallon of water, as the only supply of drinking water, according to some, appears to correct this vicious habit rather promptly.

BLACK LOCUST POISONING

A subscriber to VETERINARY MEDICINE writes us as follows in regard to the poisoning from black locust:

"While it is not poisonous when the plant is green, the wilted plants are very poisonous and it is during the dry time that poisoning is caused. They cause bloat and impaction. Please let me hear from you at once what would be the antidote.

There is some difference of opinion as to what is meant by black locust. I have used the term black locust for a tree of the legume family with white flowers and a smooth, short, flattened pod. On the other hand, some persons use the term black locust for what I commonly call the honey locust (*Gleditsia triacanthos*), which is related to the coffee bean. The technical name of the black locust as I know it, is *Robinia pseudoacacia*. This plant is closely related to Ses-



ban, which is also known to be a toxic plant. The honey locust has regular, small, greenish-yellow flowers and a long flattened pod.

The black locust has long been recognized as a powerfully toxic plant. Whether the plant is wilted or whether it is green, every part of it is poisonous. The bark, flowers, leaves and pod are poisonous.

It contains the substance *robinin* $C_{33}H_{40}O_{19}$ an aromatic glucoside which resembles the glucoside *quercetrin,* and is found chiefly in flowers, also the substance *obigenin* $C_{15}H_{10}O_6$—H_2O. The seeds are also poisonous. Dr. Millspaugh quotes Dr. Shaw as

follows, in regard to the symptoms produced by poisoning from eating the seeds: "Inability to hold the head upright, nausea and attempts to vomit, with heart's action feeble, as from exhaustion, a painful paralytic condition of the extremities, which become shrunken on the fifth day. All the symptoms seemed like those produced by a long-continued diarrhea, though in this case purging was not present." Dr. Johnson states that the symptoms of poisoning are those of Belladonna poisoning, a fact also noted by Dr. Waldron in the case of a horse that had eaten the bark; Friedberger and Frohner state that the animals have colic, tympanites and paralysis.

The other point raised, that the plant in a wilted condition is more toxic than in a green condition is interesting to note. Quite a number of toxic plants behave in a similar way. The toxin seems to develop when the plant wilts. This is particularly true of plants that contain the glusoside amygdalin. Now, of course, the black locust has, as I understand it, a glucoside and whether this is general for glucosides I do not know, but certainly this is interesting.

Dr. H. D. Bergman, to a request for a line of treatment replied as follows:

"The extent of my information on the toxic properties of *Robinia pseudo-acacia,* American locust, is to the effect that the leaves, bark and root contain varying amounts of a toxic protein, robine, the bark of the root being most active.

"The root and inner bark are said to be poisonous to cattle while the leaves are not. Robine, the active poison has emetic and purgative properties so evidently acts as a gartro-intestinal irritant. Usually addominal pain is marked. No specific antidote is mentioned, treatment necessarily being symptomatic.

"The treatment of the bloat you mention would be a matter of the ordinary routine treatment used to control excess fermentation in the rumen; i.e. antiseptics such as formalin, cresol products, etc., together with use of the trochar as needed."

Ames, Ia. L. H. Pammel.

SODIUM ARSENATE POISONING IN LIVESTOCK

On the morning of July 7th, 1928, I was called to the farm of Julius H. Spangler to see fourteen head of cattle, twelve of which were poisoned by a sodium arsenate solution which had been sprayed upon a patch of Canada thistles in the pasture where the cattle grazed. The solution had been diluted to ten parts of the solution to one hundred parts of water. The spray material was obtained through the McLean County Farm Bureau.

When I reached the farm, twelve of the cows showed symptoms of this poison in varying degrees. They gave very little milk in the morning. The coat was very rough. There was salivation in some; a profuse offensive diarrhea, some even bloody in the nature of a gastro-enteritis. There was a fast pulse with very weak heart action. Trembling, tottering, stupor, sub-normal temperature, accelerated breathing. Later, a few of the cows showed symptoms of colic. All cows that died, ten in number, became so weak that they could not rise to their feet.

Two cows died in about twelve hours after getting the poison; two more in seventeen hours; one in twenty-three hours, another on the morning of July 8, and two during July 14. The cow that died July 16, on July 8 showed signs of improvement, returned to the pasture and her milk-flow increased, but later had a second attack and died.

A bull and one cow recovered and two cows of the herd were not poisoned.

On another farm there were twelve thistles in a pasture, which were treated with the same solution, full strength, at 10 A. M. July 8 and at 1 P. M. the livestock, which consisted of three cows, one horse and two mules, were taken from the pasture. One cow died the same day and another cow and one mule were poisoned and recovered.

In the winter of 1926, I treated four cows for a client, for a poison of the same nature. At that time I suspected the hay that was being fed—stubble-clover hay. These four cows had practically the same

symptoms as the cases mentioned in the foregoing. Three died. At first I put them under treatment and they apparently made a recovery, but later they were put back on the stubble-clover hay and developed a second attack and died.

The fourth cow was not put back on the stubble-clover hay and her recovery was complete.

I did not learn, until recently, that the Canada thistles had been in the field where the stubble-clover hay was cut. These thistles were treated with the same solution mentioned in the foregoing, just after the oats had been cut. It seems probable that these cows died from arsenical poisoning.

The two herds mentioned at the beginning of this article received different forms of treatment with very little benefit, except in those animals which had a very light attack.

Veterinarians and farmers who know of this experience, especially the loss of Mr Spangler, believe that it is probably not advisable to use such poison on Canada thistles, because it has not yet been determined how long the poison might remain and later show up.

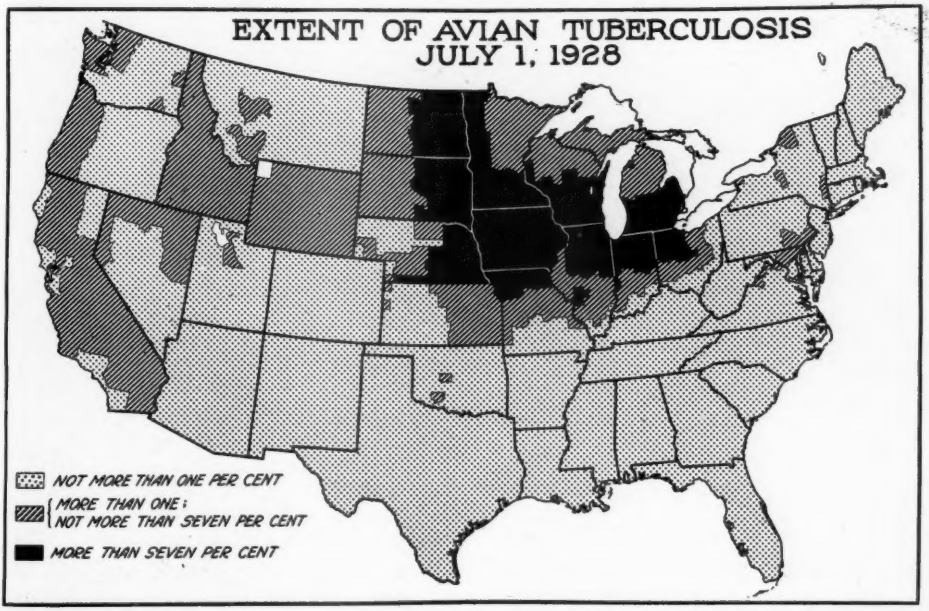
This poison is very attractive to livestock after being applied to Canada thistles.

C. B. White.

Stanford, Ill.

SARCOMA OF THE SPLEEN IN A MULE

A six-year-old mare mule was reported sick and upon calling I obtained the following history: She had weighed about 1,600 pounds, and stood 17 hands. About twelve months ago she had a case of colic in which there was marked bloat and destroyed lots of property in her jumping and pawing and


EXTENT OF AVIAN TUBERCULOSIS
JULY 1, 1928
NOT MORE THAN ONE PER CENT
MORE THAN ONE; NOT MORE THAN SEVEN PER CENT
MORE THAN SEVEN PER CENT

Veterinary specialists in the Bureau of Animal Industry urge poultry owners to become familiar with the areas in which avian tuberculosis exists and to take necessary precautions to protect healthy flocks from the disease. Full particulars are given in Farmers' Bulletin 1200-F, "Tuberculosis of Fowls." Among the chief precautions to be observed are the procurement of new stock from healthy sources only, the burning or deep burial of fowls that die of tuberculosis, and the post-mortem examination of fowls that are emaciated, lame, or which show other symptoms of tuberculosis. It is better to sacrifice a few suspected birds in a flock than to run the risk of having the disease spread, thereby causing extensive losses.

running through fences, but recovered without treatment. Off and on since that time she has had indigestion in a mild form. About two months ago she began to emaciate. The animal would eat one day and for two or three days afterwards would not eat, would take food in her mouth and just hold it.

Fig. 1

I was called to see her during this stage. On examination I found a marked icterus, pulse respiration and temperature normal, and could palpate what I thought to be the liver and made the diagnosis of some disturbance of the liver. The tumor mass shown in Fig. 1 extended up on the side where the liver is ordinarily found, and that is what I palpated. The fecal discharge from the animal was half sand.

I gave a purgative bolus with the idea of removing a considerable quantity of sand. I got the desired results from the bolus. The animal died the next day, and I found the spleen in this condition. Dr. Wharton, Pathologist of the Veterinary Department of the Agricultural and Mechanical College of Texas, made a diagnosis of sarcoma of lymphoid type.

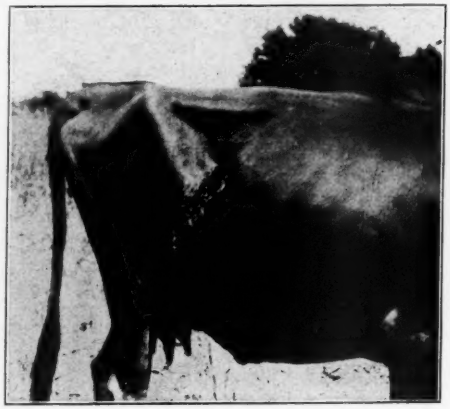


Fig. 2

I have had a case in a young cow, which is shown in Figs. 2 and 3. She was run over

by an automobile when she was a calf and the pelvic bones were broken. The pelvic cavity would just permit my hand to pass, and a Caesarean section was necessary. The pictures show the animal eight days after the operation. All the subcutaneous structures had healed and most of the skin had healed. The owner allowed screw worms to get in the incision, which prevented it from healing immediately. The animal is doing

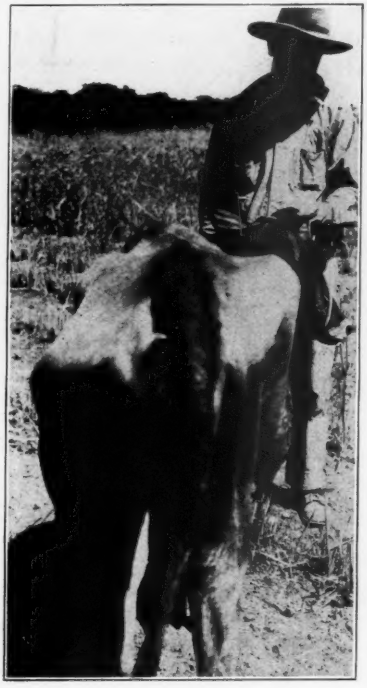


Fig. 3

nicely and giving two gallons of milk at this time, two weeks after the operation.

This operation was performed after 12 o'clock at night down in a creek bottom fifteen miles from town, with only the owner as an assistant. It takes more intestinal fortitude than brains to do this operation under these conditions.

No. 4 shows a mule bitten by a rattlesnake.

Fig. 4

Fig. 5

No. 5 shows a mare mule 14 years old with eight upper incisors.

Verne A. Scott.
John Tarleton Agricultural College,
Stephenville, Texas.

BOOK REVIEW
On "Rous Leucocytic and Allied Tumors in the Fowl"

The foregoing is the title of an interesting technical book of 96 pages in 9 chapters with 21 illustrations, by J. P. McGowan, M.A., B. Sc., M.D., published by The MacMillan Company of New York and Chicago.

The author has devoted one chapter on "Blood cell origins and nomenclature" in which the origin and terminology of blood cells is briefly discussed.

A series of inoculation experiments of Rous Tumor Number 1 is detailed in Chapter two. In these experiments two 8-months-old, leghorn cockerels were inoculated on December 11, 1927 and in both cases tumor formation occurred on January 6, 1928. Six cockerels were inoculated with small fragments of tumor tissue from one of the original cocks and seven cockerels were inoculated with tumor tissue from the other. The author details the results of the inoculation experiments and in summarizing, suggests the possibility that Rous tumor No. 1 is essentially a local manifestation of disease of the reticular cells surrounding blood vessels.

Intra-vital staining of Rous tumor No. 1 indicates according to the author, that the tumor cells are closely related if not identical to the free cells in the reticulo-endothelial tissue. The occurrence of spontaneous tumors of the Rous type were observed in 13 different cases.

Leukocytic tumors of various types probably of myeloid origin are relatively common. The Rous tumor is associated with leukemic phenomena, thus indicating a possible relationship of leucocytic and Rous tumors.

Melanotic tumors, a sarcoma and a carcinoma was investigated and the author suggests that the melanin is probably secreted in the egg yolk.

The lymphocyte and its relation to avian pathology and the etiology of tumors is discussed. The author concludes that sarcomatous tumors of fowls, including those of a leukocytic nature are probably the result of non-specific irritants. This irritant because of stimulation of cells may be called specific cell stimulin.

This is an interesting book to read and will be of value to research workers. It shows that some progress has been made in the investigation of tumors of fowls. The book has no practical application for clinicians.

ECZEMA

Eczema! What is it? Is it a blanket expression covering a batch of ignorance? We define various skin conditions by name according to modern classification and the "left over" conditions are usually termed eczema. One practical sage centuries ago had the simplest classification of skin diseases ever devised:

(a) Those that sulphur would cure.
(b) Those that mercury would cure.
(c) And those that nothing would cure.

Does eczema belong to the group that nothing will cure?

We all know the picture of eczema i. e., an acute inflammatory skin affection characterized by a gummy discharge from the affected parts with severe itching. As the diseased skin secretions cease, crusting and scaling appears.

What are the causes of eczema?

I have in my hospital every so often a certain airedale dog that breaks out in an acute eczema every time tar soap is used on him. Creolin acts the same way if it is used in his bath water. I was at first of the opinion that too frequent bathing was the cause and suggested corn meal dry cleaning. It was used over a period of months and the skin remained normal. This animal got into some carrion and it was necessary to give him a bath. Ivory soap was used for no other reason than that it was most available at the time. No irritation followed. A couple of weeks later, however, instead of returning to the dry cleaning process a tar soap bath was given at home. He broke out again. Since then he is bathed regularly with non-medicated soap and no trouble has followed.

This would appear as one of those cases where the skin reacts to chemical irritants.

There certainly is plenty of evidence to believe that constitutional causes play a prominent part in eczemas. Disorders of the digestive tract, general debility or lack of tone, rheumatic diathesis, worms, etc., are predisposing factors.

The external causes are excessive use of water, strong soaps and chemicals, parasites, dirt, etc.

Treatment

There is always some modification of the diet attempted. Most of us feel it is necessary to do some manipulating or changing of the menu figuring the dermatosis may be a sensitizing phenomenon of some sort, which no doubt, it often is. "Fill out the lean hound; thin down the fat pup" are usual procedures. In some cases "no meat," in others, "all protein." In most cases we use some internal medication. Arsenic in chronic cases. Eliminants and depletants such as milk of magnesia or salts are often given. Internal treatment never enthuses me much except the advisability of a good worming when indicated.

Local applications bring tissue changes that are beneficial and do it in a hurry and that is what your client wants and so do you. Water is contraindicated in acute skin irritations or in fact any kind. Oil or alcohol cleans as well. Try to sterilize the abrasions with a non-irritating type of antiseptic. Use a warm air blower to dry or expose to infra-red rays (heat). Follow with calomine lotion or dusting powders in weeping or acute types. Arrange in some manner to keep the patient's mouth away from the treated areas, first, because they will aggravate the irritation by licking and biting, and second most powders and lotions contain zinc which is poisonous.

In the dry or chronic type of eczema ointments are useful. When progress to recovery slackens in the scaly or chronic type a little salicylic acid 1% to 2% may be added to your antiseptic ointments.

To sum up. Acute types demand sedative treatment. Stationary or chronic (scaly) types of eczema require stimulative treatment. In some old cases it may be advisable to apply a mild rubifacient to desquamate the diseased top tissue and excite a new underlying growth of healthy tissue.

E. B. Dibbell.

Baltimore, Md.

The Toxicity of cotton seed meal can be diminished by subjecting the meal to a high temperature under pressure. Cotton seed meal that has been heated, when properly supplemented, does not interfere with growth and development, but constitutes a valuable protein supplement feed for swine.

A few days ago, I was called to an adjoining town to remove a placenta from a cow, and I happened to notice a condition in a calf which I had not heretofore seen, read or heard about, and at first I thought it was a scrotal hernia, but on careful examination, a fully developed testicle, equal in size to an adult animal's organ was revealed. The illustration shows the condition.

Winsted, Conn. C. A. Burnette.

External Parasites of Poultry

By F. D. PATTERSON, JR.,
Auburn Alabama Department of Veterinary Medicine, Alabama Polytechnic Institute

OF ALL external parasites that infest poultry, none are more annoying and destructive than the common henhouse mite—*Dermanyssus gallinae*. This troublesome little pest is a very common inhabitant of poultry houses and other protected places that are visited by poultry.

Description:—The henhouse mite is a very small, eight-legged parasite. It can be detected easily by the unaided eye, when infestation is heavy; though at times a very careful examination is necessary to discover their presence, and they are frequently overlooked by the inexperienced. These mites are more or less oval to oblong in shape. They resemble dust particles when not in motion. When on their host they are usually very active, but are often found in a resting state in the house. In color they are a dusky grey, but change to a bright red as soon as they become engorged with blood.

Life History and Habits:—The henhouse mite is nocturnal in its parasitic habits, hiding away in dark corners, cracks, crevices, under filth, straw, etc., in the day-time; coming forth at night to feed upon the blood of poultry and otherwise annoy their hosts. These parasites readily get on animals that come in close contact with infested quarters, but are strictly stray parasites when on any host other than poultry. The females deposit their eggs in their day-time retreats. The eggs hatch in approximately one week. The young parasite resembles the adult but is smaller and has only six legs. Immediately after hatching the young mite begins a life of parasitism. In a short time another pair of legs is developed, though under unfavorable conditions maturity may be delayed for a considerable period. The fact that this species of mites makes its raids at night is probably the main reason why the presence of these parasites and the cause of the great damage done by them often goes undetected for a long time; especially by those unfamiliar with their habits.

Effects Upon Host:—The henhouse mite is a true blood-sucking parasite. Heavily infested fowls become anemic, emaciated, weak and succumb to the effects of disease readily. Mites cause the infested host much discomfort; producing severe irritation by biting and continually crawling over the body of the host. Setting hens are often troubled to such an extent that they are forced to leave their nests, thus the hatchability of eggs entrusted to them for incubation is materially lowered. Decrease in egg production is often a very serious consequence of mite infestation. Retarded growth of the youngsters is frequently a source of much loss in flocks infested with these parasites. Death of infested birds is not an uncommon result. Infested birds are restless and suffer a great deal from pruritis. As already stated, mites are nocturnal in their parasitic habits, though their presence on fowls in the day-time is by no means uncommon in heavily infested flocks, especially is this true in the case of setting hens and weak birds. Weak birds make very suitable hosts for parasites, so are very subject to their attacks, therefore we must guard against confounding cause with effect. Besides the great amount of damage directly done by these pests of the poultryhouse, they also materially contribute to losses indirectly by predisposing to disease and aggravating diseased conditions that already exist.

To find mites, a very thorough and diligent search may be necessary. Examine carefully their day-time retreats, loose splinters in the house should be pulled off and a close examination made beneath them. When infestation of the house is very bad, the mites will immediately crawl upon the examiner as soon as they are disturbed.

Control:—Control is not so difficult if

preventative measures are diligently applied; but if mite infestation is once well established they are very resistant and make stubborn foes to combat. Prevention is best maintained by providing houses with the entire inside walls, fixtures, etc., made of smooth material, cracks, crevices, and other dark retreats should be at a minimum. Houses should be well ventilated, dry, and so arranged that the direct rays of the sun can penetrate as far as practical all parts of the interior of the house. Direct rays of the sun are very destructive to mites. Strict cleanliness should be closely adhered to, houses being frequently cleaned and sprayed with some good disinfectant and parasiticide. Droppings should be removed as nearly every day as is practical; straw and other litter as often as is deemed necessary. These materials should not be thrown on soil that is used by poultry, but should be burned or placed on fields that are remote from poultry habitations. The fertilizer value of these materials is too great to permit them to be wasted; so it is an economical plan to use them on distant fields. Houses should be occasionally whitewashed; six months to a year being about the correct intervals, though we should be governed by individual conditions. The material used should contain about 5% creolin or other suitable coal tar disinfectant. This combination should be used on all house materials, both inside and outside. No cracks, crevices, etc., should be overlooked. For spray materials, kerosene oil makes an excellent base; it being destructive to parasites and at the same time having a decided tendency to spread; ferreting out the parasitic retreats, carrying with it the other materials used. A good spray preparation can be made by using one part creolin or some of its many potent substitutes to eight parts of kerosene oil. This spray should be used about once a week in the summer months, and every ten days to two weeks in winter; the exact frequency depending upon individual conditions. A combination that has been recommended to me by good authority is, one part kerosene to four parts crude oil, this makes a cheap preparation but is a little difficult to apply as it is too thick to use in a spray, and must be applied with a brush. However, if it is as effective as recommended, much time and trouble will be saved, for according to the authority quoted, one application a year is all that is necessary.

There are many other preparations that may be used successfully. The ones mentioned are only given as good examples, giving the reader some standard to follow. Individual treatment is seldom necessary, except on setting hens and weak birds; the latter are usually more economically destroyed. Setting hens are best treated with an insect powder; those powders containing a high percentage of pyrethrum are most effective according to my experience. Liquid preparations are not suitable because such agents would materially injure the hatching qualities of the eggs. Dust baths are also very helpful.

Scaly-Leg Mite

There is another species of mites that is very objectionable to poultrymen, and that is the scaly leg mite—*Cnemidocoptes mutans*. These mites are very small, and are best detected under a hand lens or low power of the microscope. The clinical manifestations are, however, sufficient for diagnosis. These mites belong to the mange-mite group, and are closely allied to the sarcoptic mange mite (scab mite) of animals. The principal damage done by them is the production of a very unsightly appearance of the feet, legs, and toes, though no doubt they sometimes cause a slight loss in the case of exhibition birds. This condition is largely due to neglect, for if checked in the beginning it may be controlled easily and effectively.

The symptoms produced are familiar to all who have observed poultry, so only brief mention of them will be discussed here. The scales of the affected parts first begin to separate, a mealy accumulation appears, which is grey in color, and in the form of a dry bran-like crust; these formations, if neglected, often become very large, obscuring the form of the legs, feet and toes.

The treatment consists of washing the af-

fected parts with warm, soapy water, allowing them to dry, and then applying kerosene oil. In case many birds are affected the bath can be omitted, as such a procedure is impractical where large numbers are to be treated. Kerosene can be very effectively and easily applied with a rag, or brush, or the affected parts may be dipped in the oil. In using kerosene, care must be taken not to let any of the oil come in contact with the feathered parts, or a severe and obstinate blister will very likely result, for kerosene will blister if it comes in contact with parts where free circulation of the air is excluded. Washing the affected parts in kerosene emulsion is a good treatment, preliminary washing is thus rendered unnecessary and danger of blistering the patient, should any of the material get on the featured portions of the skin, is minimized. Any oily substance should give good results; however, the kerosene treatment is an excellent one, as it is more penetrating than most other suitable agents. Treatment should be repeated at weekly intervals and continued as long as necessary. If treatment is started in the early stages the condition will, as a rule, respond readily; one application often being sufficient. If neglected and allowed to become chronic, the disease will resist treatment, so that many repetitions of the applications will be necessary.

BLOOD OF THE DAM FOR PNEUMO-ENTERITIS OF PUPPIES

In your August, 1928, issue of VETERINARY MEDICINE you have an article "Pneumo-Enteritis in Puppies." I have seen a number of cases which although they do not exactly correspond with your description, yet die within three days of birth and are cyanotic.

I have been very successful by treating them as follows. For eight pups, collect one ounce of blood with citrate solution to prevent clotting. Blood is taken from vein inner aspect over the carpus of the mother of the pups. Subcutaneously inject 3 or 4cc (about 1cc into three or four sites) into each pup. Gently massage to disperse. No other treatment is given except that I put the mother on course of potassium iodid.

With this treatment I have had no more deaths. I advise clients to call me as soon as puppies are born, of course, having had previous experience of losses from the same bitch. J. R. Stewart.

Sydney, Australia.

Five thousand alleged horse thieves were arrested and 10,000 stolen horses returned to their owners in Ukraine during a two weeks' campaign to stamp out the evil.

Common Diseases and Parasitisms of Sheep

By Frank Breed, Lincoln, Nebraska

THE time allotted for this subject permits a discussion only of some of the more common and important conditions as they are encountered in the middle west or Mississippi Valley.

The maladies of sheep may be classified for convenience as follows:

1. Parasitic diseases.
2. Infectious diseases.
3. Feeding problems.
4. Protozoan diseases.

Parasitic diseases were placed first in the classification because without a doubt, they cause the greatest loss to the sheep industry and are most often encountered by the veterinarian.

The damage from parasites is greatest as a rule among lambs and young adults. The young tissues seem less resistant and more intolerant of injury and the more sensitive nervous system breaks down more quickly under the influence of parasitic injury and poisoning from the excretions and secretions of parasites.

The external parasites of sheep are all arthropods, or animals having six or more legs, some of them being insects, which have six legs in the adult stage, others, such as mites and sheep tick-melophagus ovinus ticks, being more closely related to the spiders and possessing eight legs in the adult stage. Some of these parasites spend their lives on the sheep; this is true of the scab mites and the lice. These are the important forms.

Sheep Tick—Louse-Fly

This parasite inhabits the wool and the surface of the skin. It is prevalent in all parts of the United States and causes considerable economic loss each year. The parasites are common on coarse wool sheep, and prefer the neck, breast, shoulders, belly and thighs.

The damage done by the sheep tick is of two kinds. It is a blood-sucker, thus causing great irritation, loss of blood, interference with feeding, and consequently poor nutrition and reduced vitality. The ticks may be easily found on parting the wool. Their presence may be suspected when sheep bite, scratch, or rub and showing a ragged fleece as a result.

Treatment: Dipping in solutions of coal tar, creosote, cresol, nicotin and lime-sulphur arsenic are satisfactory, but dips containing arsenic are not desirable for sheep.

Sheep Scab

This is one of the oldest known, most contagious and most injurious disease affecting sheep. Its history dates back to the earliest ages of civilization. It is a highly contagious skin disease, easily transmitted from one sheep to another, and spreads very rapidly, after being introduced into the flock.

The mites which cause common sheep scab are small insect like parasites known as *Psoropts ovis.* The mites may be seen with the naked eye, particularly if they are placed on a dark background. They occur on all parts of the body covered with wool, but are most common where the wool is thickest.

This parasite being a blood sucker, pricks the skin and causes a slight inflammation which is manifest by a reddening of the skin. This stage of the disease is rarely if ever detected upon casual observation. As the mites multiply, large numbers of small wounds are made in the skin, and are followed by intense itching, with formation of papules, inflammation and exudation of serum. The serum mixed with blood, dirt and natural excretions forms a scab which covers the

* Presented at the 15th Annual Meeting of the Eastern Iowa Veterinary Association, Cedar Rapids, Oct. 17-18, 1928.

highly inflamed area. As the mites multiply they seek the healthier parts around the edges of the diseased area or scab, which is continuously enlarged. The affected area becomes hardened and thick, which is readily detected by pinching up a portion and comparing it with the surrounding healthy skin. Other conditions resembling scab rarely if ever cause this characteristic uniform thickening of the skin.

As the disease advances increasingly large areas become entirely denuded of wool. Scabs fall and are replaced by thicker and more adherent crusts. The skin finally becomes more or less bare, is greatly thickened, and may crack and bleed.

The treatment of this condition is dipping the animals in a recognized preparation which will destroy the parasites and not be injurious to the animals.

The commercial dips may be divided into five general groups: Those containing arsenic, the cresylic-acid group, coal-tar, creosote dips nicotin and lime and sulphur. Of these the B. A. I. recognize only two groups for the official dipping of sheep for scab, namely: Lime and sulphur and nicotin and sulphur. The most satisfactory strength of lime and sulphur is a dilution of the concentrated commercial dip one part to fifteen parts water. The nictoin, and sulphur dip is made with sufficient nicotin solution and flowers of sulphur to give a mixture containing not less than .05% nicotin and 2% sulphur. Ninety-six (96) gallons (about 800 lbs.) of dip would require one (1) pound of a 40% solution of nicotin and of flowers of sulphur, sixteen pounds.

Stomach Worms of Sheep

The stomach worm (Haemonchus contortus) is without a doubt, the most common internal parasite of sheep, especially in the middle west. This parasites inhabits the abomasum, fourth stomach, where it produces its injurious effects, due to its blood sucking and inference with the proper digestion of the food.

The first things noticed about infested sheep are dullness and lack of thrift. Diarrhea may be present. Later the animal shows anemia and edema. The anemia is manifested by paleness of the skin and linings of the mouth and eyelids. The edema is manifested by swelling of the pendant portions of the body, especially the tissues of the intermaxillary space and throat. Animals may become emaciated and finally die. On autopsy the animal is usually emaciated and the muscle pale. The contents of the fourth stomach are more or less fluid and contain a large number of small reddish worms. A number of the parasites will remain attached to the mucosa, and if the stomach wall be washed a large number of small hemorrhages will be found in the lining, caused by the parasites attaching themselves to the lining for the purpose of blood sucking.

Copper sulphate in a 1% solution has given good results.

Copper sulphate, 1% and nicotin 1% mixed in equal parts have also given good results. More recently oil chenopodium and tetrachlorethylene have supplanted in many instances the copper sulphate treatment. The tetrachlorethylene is preferable to the chenopodium, due to its less toxic qualities and this preparation will also remove other parasites such as round worms and hook worms.

Prevention of infestation of the lambs is the great factor in the control of this condition. Briefly, the proper disposal of the manure and rotation of pastures will be found exceedingly helpful.

Hookworm Infestation

Hookworm infestation, a condition which is easily overlooked and which has confused many men holding autopsies in herds where stomach worms were considered to be present. This small, more or less red-colored parasite inhabits the small intestines of sheep and cause a great deal of damage. The clinical picture is practically the same as that of stomach worms. On autopsy, the contents of the fourth stomach will usually be found normal instead of semi-fluid and

the mass of stomach worms is absent. The examination of the small intestines will show many small hemorrhages studding the mucosa and on careful observation the small red-colored parasites will be found.

The treatment consists of coppersulphate-nicotin solution, but oil of chenopodium and tetrachlorethylene in capsule form will be found more satisfactory.

The writer feels that it is not necessary to touch upon the subject of tape worms but before leaving the subject of parasites of the digestive tract, I would call

Nodular Disease

attention to nodular disease which is so common in sheep. This is due to the parasite *Esophogostoma columbiana,* and let me warn you not to call this *tuberculosis;* a thing that has been done many times in the past.

Lung Worms of Sheep

The thread lung worm, strongylus filaria, is found in the air passages bronchi and bronchioles of the lungs. These are rather long worms, easily observed. They are white and the intestine shows as a dark hair line throughout the length of the worm. The worms, their eggs and larvae set up an irritation of the lung tissue at the point where they are located, causing an inflammation and a catarrhal condition, the latter manifested in the production of a frothy mucus, sometimes containing traces of blood. Bacterial infection of the weakened lung tissue may follow, causing the organ to show pus and consolidated areas. The first symptom noted is a husky cough and if the invasion is extensive this may be followed by difficult breathing. If the condition is left alone some animals will die from weakness and suffocation.

Treatment: Intratracheal injections as in cattle has not been very satisfactory in the treatment of lung worm in sheep. A treatment which has been used rather extensively with reports of satisfactory results consists in injecting chloroform in 3cc doses into the nostrils of the sheep by means of a medicine dropper, the head of the sheep being tilted back. The nostrils are then held with the fingers until the animal is groggy. This treatment may be repeated at intervals of three to five days, if necessary, for a total of not more than three doses. It has also been recommended that a dose of Epsom or Glauber's salt be given two hours after the treatment.

The hair lung worms, *Strongylus rufescens,* occur in the small bronchioles and in the lung tissue. This parasite is much smaller than the one described above. The body has a characteristic brownish red color, due to the color of the intestines. These parasites cause various forms of verminous pneumonia. The adult worms cause a lobular pneumonia: the eggs and larvae cause diffuse pneumonia, or when aggregated in the pneumonic areas may cause a pneumonia with areas resembling tubercles. These areas show as grayish yellow tumors, which may attain a diameter ranging from a few millimeters to two centimeters. Careful post-mortem examination of these pneumonic areas will disclose the reddish worms, and the eggs and larvae may be found by microscopic examination of these tissues.

Treatment. No satisfactory treatment for this particular parasite has been found, although the treatment recommended for the thread worm may be tried.

Hemorrhagic Septicemia

It is doubted by some that such a disease as this exists among domestic animals, but according to my opinion it not only exists but cause losses among sheep. The disease usually appears in the band, particularly among highly fed lambs, following passage through public stock yards, or after being in rail transit for some little time. Sudden changes in weather also appears to precede an outbreak of this disease. In lambs the disease first appears in the form of sudden deaths; in others the animals may be sick for two or three days, with a discharge from the nose and eyes; sometimes accompanied by a cough and sneezing. They

often refuse food and appear gaunt. The breathing is rapid and temperature elevated. The post-mortem findings and the proper handling of this condition is familiar to all.

Dysentery of Lambs

Paratyphoid dysentery as reported by Newsom in 1925, we do not expect to encounter very often, for there has been only this one outbreak reported in this country. According to Newsom, "The animals become dull, refuse food, the ears droop, the head hangs, the temperature increases from two to four degrees and a diarrhea manifests itself which later becomes bloody. The mortality in this outbreak was 6.2%."

"Inflammation of the fourth stomach and small intestines was fairly constant on post-mortem examination." This disease is rather easily differentiated from Hemorrhagic Septicemia by its being confined almost entirely to the digestive tract, whereas in hemorrhagic septicemia the localization takes place in the lungs."

Lip and Leg Ulceration

True lip and leg ulceration is a widely distributed and well known disease of sheep. The cause of the disease is the B. necrophorous which enter the tissues through abrasions from various sources. The ulcerations may occur on the following parts: lips, nose, chin, cheeks, gums, hard palate, legs and feet, also on the genitals of both sex, and the tail stumps of docked lambs. As the name of the condition denotes, the most common form of the disease occurs on either the lips or legs or on both parts simultaneously. The active stage manifests itself in the various locations by inflammation, swelling, ulceration and gangrene, with or without scab formation. A typical offensive odor, similar to that of limburger cheese, is given off from the affected parts.

Losses from this disease are at times severe, reaching as high as 20% to 30% of the flock.

This condition must be differentiated from non-contagious foot rot. The latter disease lacks the characteristic odor and does not form ulcers. There is also a lack of lip affection in the flock. Non-contagious foot rot is manifest by the formation of abscesses between the toes, which involves the biflex gland, situated between the toes, or the opening and canal of the same.

Stomatitis of Sheep

Sore mouth or stomatitis is of an infectious nature and may be due to staphylococci, streptococci and occasionally to invasion of B. necrophorus. According to Newsom, "In this condition small vesicles arise on both the inside and outside of the lips. These soon break leaving a raw surface that bleeds easily. Extraneous organisms then gain entrance and the disease may show a rapid disappearance, lasting only a few days, or the inflammation may increase, the lips become greatly swollen and covered with a thick crumbling scab. In the latter case, the lamb may refuse to eat owing to the pain caused thereby. Emaciation follows rapidly and, especially if the necrosis bacillus gains entrance, death may result."

Overloading—Apoplexy

Overeating, also known as aploplexy, indigestion and gastroenteritis, is caused by feeding concentrates, such as corn, barley, peas, etc., in excessive amount over a period of time with limited amount of roughage. The symptoms of this disease vary considerably. Some animals may die without showing symptoms. In a few instances the head is thrown back, the lamb staggers, falls to the ground and dies in convulsions. More commonly lambs live a few hours, showing cerebral symptoms, such as the head being thrown back or running in a circle or pushing against a fence. In these cases, some diarrhea may be shown before death. In those living still longer, some will vomit up grain.

The lambs stop eating, a diarrhea supervenes and may continue for several days. In these cases death may occur

(*Continued on page 44*)

Reviews and Abstracts

Anti-Rabic Action of Snake Venom

Madame Phisalix has previously demonstrated that the venom of the southern viper, Vipero aspis, associated with the mucus of certain batrachians, confers on rabbits, when they are inoculated therewith, immunity to the virus of rabies, even when the latter is introduced intra-cerebrally. The venom of the viper and of batrachians is rabicidal or preventive in vivo. In either case the blood of the vaccinated animal also acquires anti-rabic properties. The author now shows that viper venom, when heated to the temperature of 100° C. for ten minutes, which totally destroys its toxicity, retains its rabicidal potency, unimpaired in vivo and also in vitro. This proves that the toxic principle in the venom is quite distinct from that which has the anti-rabic effect. Madame Phisalix (L'Union Phar., 1928, 64, 200).—*The Veterinary Record,* vol. VIII, No. 28.

Two Kinds of Brucella Abortus, One Causes Undulant Fever

Milk or milk products are probably the source of undulant fever, the new disease that is becoming more and more prevalent throughout the country. This statement was made at the meeting of the American Public Health Association by James G. McAlpine, of the Storrs Agricultural Experiment Station, and Friend Lee Mickle, of the Connecticut Department of Health. Cattle of all kinds may be infected with the germ of the disease. In countries around the Mediterranean the goats carry the germs, but in this country it has been traced to cows, where it appears as infectious abortion. When human beings drink milk from such infected cows, they may get the human form of the disease, undulant fever. However, cows are infected with two kinds of the *Bacterium abortus,* the germ causing the disease. Probably only one of these two is capable of producing the disease in human beings, which is the reason why not every person drinking infected cow's milk gets it.—*Science—Supplement,* Vol. *LXVIII,* No. 1764.

CONTROL OF PARASITES OF LIVE STOCK

(*Continued from page 572 of the December number*)

Acarians as Disease Vectors

Sambon[67] has published an exceedingly interesting article on this and related subjects. Although it has little practical value for veterinarians its historical significance on the subject of insect (and acarian) carriers of disease from animals to man gives it an importance. The author was the first (in 1906) to identify Rocky Mountain spotted fever as a form of typhus. He was the first to suggest that the body louse was the probable vector in typhus in armies.

Typhus he claims is and has been for untold centuries of almost world wide distribution and is transmitted to man by various acari and other parasites. In various localities certain animals constitute reservoirs for the infection. He finds it carried by ticks, flies, harvest mites (chiggers), lice, bed bugs, mosquitos, itch mites and chicken mites.

He points out that the Japanese have known for more than a thousand years that harvest mites transmitted river fever, a form of typhus and that a scientific work published in China more than 300 years ago gives a description of typhus as it occurs in China and states that it is conveyed only by the bite of a parasite (chigger).

He believes the Indians of Mexico also knew that typhus was transmitted by an acarus since the name by which the disease

[67] The Parasitic Acarians of Animals and the Part They Play in the Causation of Eruptive Fevers and Other Diseases of Man, by Louis W. Sambon, M. D.; *Annals of Topical Medicine and Parasitology,* Vol. XXII, No. 1.

was known when Spaniards first visited Mexico clearly indicates this. 800,000 Indians in Mexico died of typhus in 1545 and 2,000,000 in 1576 according to Spanish and Indian records. In this connection, it might be added that the natives of East Africa before the coming of white men to that country, called malaria and its mosquito carrier by the same name.

The author believes there is an intimate relation between contagious epithelioma of birds and small pox of man, and thinks the ancients may have recognized this since the Persian name for small pox is the same as for a bird affected with contagious epithelioma, and because of the record that the plague that annihilated the Abysinnian army about 570 A.D. was small pox carried to them by swallows.

He believes that under some circumstances avian diphtheria is communicable to man and that the passage in the Fourth Book of Moses (Numbers XI, VV 31-34) refers to an instance where this occurred. He thinks a passage in the First Book of Samuel (Chap. VI, VV 4 and 5) indicates that the part played by rats in epidemics of plague was known to the ancients.

Carbon Tetrachlorid Effective in the Treatment of Liver Rot in Cattle

An incomplete report of some valuable work undertaken by Jones and Montgomerie[68] indicates that carbon tethachlorid is a remarkably efficient parasiticide for liver flukes in calves. The losses from liver flukes is a very considerable one, including animals that die as a result of infestation and the far more disastrous wastage of fluke infested livers upon slaughter. The authors have observed outbreaks of distomiasis in which 50% of the animals in the herd died as a result of infestation.

The treatment of five groups of calves aged between 6 and 11 months in advanced stages of the disease was undertaken. All of these calves were badly infested and losing weight rapidly. Many of them were so weak as to be unable to rise when down or to stand without aid, and appeared moribund. It was thought that several of them would have died in a day or two if treatment had not been given.

The treatment consisted of 5cc to 10cc of pure carbon tetrachlorid given orally in soft gelatine capsules. Within 10 days following the treatment, much improvement was noted and the general appearance of good health returned.

A month after treatment very marked clinical improvement was seen. At this time small numbers of fluke eggs could be detected in the feces in one calf. The authors believe that all mature worms were killed by the first treatment but that immature forms had escaped destruction.

A month later, or two months after treatment all these calves had wasted away to an unbelievable degree. They were extremely weak and could walk only with difficulty. Their eyes were sunken and those lying down had to be assisted to their feet and steadied before they could stand alone. Fluke ova were present in enormous numbers in the feces.

A second treatment was given. The beneficial effect of which was very striking. Improvement could be detected in two days and nine days thereafter saw an advance which continued for more than a month.

After seven weeks some fluke eggs again appeared in the feces and a third treatment was given.

The result in the remaining groups were similar except that in some cases, the parasitism was allowed to continue to an even more advanced stage. For example, one is described as being in a shocking condition, very weak and unable to rise, its mucous membranes quite p a l l i d, temperature 104.2°F,. appetite very capricious and rumination in abeyance. Many fluke eggs in the feces. Three weeks later, marked improvement had occurred and the animal while voiding a few fluke eggs in the feces, had the appearance of health.

The authors conclude that when part of

[68] A Note on the Treatment of Liver Rot of Cattle with Carbon Tetrachlorid, by T. H. Jones and R. F. Montgomerie; *The Veterinary Record*, Vol. 8, No. 14, April 7, 1928, pp. 269-271.

the infestation consists of immature flukes, redosage will be necessary and in some cases, as in group No. 1, a third dose is needed. However, since the infestation is obtained at pasture, as the period lengthens after the animals are taken off pasture and put into the feed lots, more and more of the flukes become mature and when all are mature, a single dose is sufficient; but if the infestation is heavy, it is advisable to dose from time to time as crops of flukes mature. Two doses are frequently required and three may sometimes be necessary for calves where the treatment is begun in early fall.

No attempt was made to ascertain the minimum effective dose, nor the dose that would be tolerated, but in only a few instances and those strangely enough in the healthiest and strongest calves, were any toxic effects shown from doses ranging from 5cc to 10cc depending on the weight of the calf.

The authors extend their thanks to an American pharmaceutical firm, Parke, Davis and Company, for generously supplying the carbon tetrachloride used in the experiment.

Treatment of Parasites in Army Horses

A recent article by Col. Turner[69] is on a subject so important and upon which there is such an urgent demand for more information, that although the report is a preliminary one, it is deemed advisable to make the following lengthy excerpts, that the information so far developed in this experiment may have the widest possible publicity among veterinarians.

There has been an increasing demand from horse breeders throughout the country, especially those connected with the raising of thoroughbreds, for some definite method of eliminating internal parasites in horses, particularly in colts. Because of such demand the Surgeon General's office, through its Veterinary Division, instituted a rather intensive campaign with a view to determining certain facts that would prove of value and interest to the horse industry at large.

Some of the most successful breeders, owners and trainers of thoroughbreds have from time to time disposed of their one to three-year-old colts because of their lack of the usual characteristics which go to make rugged race horses. In numerous other instances their failure to take training with the vim and dash that bespeaks a profitable career resulted in their finding a new home. Some of these colts in the hands of their new owners and trainers have gone on and qualified for the hall of fame of horsedom by their performances and have won fortunes for their purchasers, while many others have become most useful breadwinners.

There is no way of determining just what part infestation with internal parasites may have played in the decision to sell a colt that afterwards became an outstanding performer and winner, but there are good reasons for suspecting that it was frequently an important factor. Neither is there any way of knowing whether such colts received any treatment for these parasites from either owner.

The degree of infestiation varies not only in colts of the same age but in the same colt at different ages, that is, a colt may escape as a weanling and be heavily infested as a yearling, and less so as a two-year-old, and vice versa. It is quite probable that the colt sold for a nominal price by experienced owners and trainers because he was not the "kind," was suffering from enervation due to a heavy infestation of worms that surely put him below par.

There is no possible way of estimating the various and sundry ways in which intestinal parasites may adversely affect the growth, the health, the development, and the final perfection of any horse, and especially the thoroughbred, but that they do have a very definite influence seems beyond question. Dr. Arthur Whitehouse, Professor of Anatomy at the Edinburgh Veterinary College, states that in his many years of research he never yet has found a normal anterior mesenteric artery in a horse, the obvious inference being that all horses at

[69] Experiments in the Treatment and Control of Internal Parasites in Horses, by Col. W. Geo. Turner, V. C.; *Army Veterinary Bulletin*, Vol. XXII, No. 3, September 1928.

some time have had a parasitic infestation, producing an abnormal condition of this artery (verminous aneurysm). Here again one is reminded of the far reaching effects of internal parasites, and the opinion is rather forced upon us that probably a great percentage of the deaths of horses in racing, training and nurseries, resulting from so-called heart disease, are in all probability the result of aneurysms due to invasion of parasites. From these aneurysms certain particles are given off into the circulation which may and do obstruct the proper blood supply to some part of the anatomy. If this happens to involve the blood supply to one of the legs, a real lameness is manifested and a diagnosis of the cause is most difficult and treatment of little value.

Our observations gave us the usual typical picture of a colt suffering from the effects of parasites, with hair standing on end, habit of biting himself, pot belly, and a generally unthrifty appearance. On the other hand, colts appearing to be in excellent condition without any of the characteristic manifestations of unthriftiness have, in many instances, upon treatment, proved to be as heavily infested as the others. When evidences of infestation are not apparent, the presence or absence of parasites may be determined by examination of the droppings for eggs or larvae or the worms themselves before giving the treatment. However, we treated 100 per cent of our colts, and it is believed we will do so yearly unless and until more efficient control measures are developed.

We selected the late fall as the most practical season for beginning our experimentation and until some definite control measures have been provided, it will prove to be the best time for such treatments. When brood mares with colts by their sides, weanlings, one, two, and three-year-olds, a majority of which are carrying one or more varieties of the group of parasites for which equines are the natural host, have grazed over the pastures for several months, it is not hard to visualize with what ease and certainty reinfestation is effected and how futile treatment would be under such conditions. Therefore, the late fall, with its consequent frosts that kill or in some other way cause the bot fly to disappear and to a great extent begins the process which winter continues of cleaning the pastures of the lurking larvae of all parasites, is the best time for treatment.

Bots and ascarids: In the treatment for bots and ascarids found in the stomach and small intestines, the agent carbon bisulphid was used in doses of from 3 to 7 drams, depending upon the weight and age of the animal, as follows:

Weanlings, 3 to 4 drams; yearlings, 4 to 5 drams; 2-year-olds, 5 to 6 drams; 3 and 4-year-olds, 6 to 7 drams.

This is figured on a basis of approximately 3½ drams to each 500 pounds.

All food was withheld for 18 hours (given water only), and this period of fasting was so arranged as to terminate in the morning, at which time the proper dose of carbon bisulphid was given (preferably through the stomach tube). No other medicine of any kind is given either before or after the carbon bisulphid, but a small amount of water may be administered through the tube to insure all of the drug reaching the stomach.

The carbon bisulphid may be given in one or more capsules with a balling gun, but care must be taken to avoid breaking the capsule in the animal's mouth, which would cause considerable irritation of the membranes of the mouth and throat, but probably without serious results, unless the drug goes to the lungs.

Srtongylus (palisade worm), Oxyuris (pin worm), Cylicostome (blood-sucker): Oil of chenopodium was used in the treatment of this group of parasites primarily inhabiting the large intestines, in doses of 1 dram for each 250 pounds weight of the animal. The chenopodium is mixed with raw linseed oil in quantities of one pint for weanlings, to one and one-half pints for yearlings and 2-year-olds, and one quart for 3-year-olds and upwards. This mixture is given preferably through the stomach tube or as a drench.

All food was withheld for 36 hours (water only), the fasting period terminating

in the morning, at which time the oil of chenopodium was administered.

The margin of safety in the administering of oil of chenopodium is more sharply defined than in that of the carbon bisulphid and it should therefore be given more carefully in accordance with the exact weight of the animal being treated. It should be remembered that all drugs used against internal parasites either in man or beast are essentially poisons. The line of demarcation or margin of safety is often a narrow one and in the absence of definite data the matter of dosage was, of necessity, cautiously approached. It is important that all of the medicines used should be of known freshness, potency and purity, and in order to obtain the desired results every detail of treatment should be carried out carefully.

Because of the wide variation in the quality of the raw linseed oil that is available commercially we have recently tried out a mixture of neutral oil which is put out under various trade names such as Nujol, Russian oil, etc. This oil has no purgative action so we may add castor oil in the proper proportion as appended, then add the dose of chenopodium as indicated and shake thoroughly so as to mix the three ingredients and give in place of the linseed oil and chenopodium. We believe this will reduce, and probably eliminate, the incident of superpurgation which has occasionally followed the chenopodium and linseed oil mixture.

The inclination has been to charge colics, or worse, to the chenopodium, but it is more probable that an impure linseed oil was the offender.

The following is suggested as a safe substitute for linseed oil:

Weanlings: Castor oil, 4-6 ozs.; neutral oil, 1 pt.

Yearlings and two-year-olds: Castor oil, 6-8 ozs.; neutral oil, 1 pt.

Three-year-olds and older: Castor oil, 8-10 ozs.; neutral oil 1½ pts.

The chenopodium to be thoroughly incorporated in this combination of oils in the same dosage as is recommended when linseed oil is used.

Treatments with carbon bisulphid or oil of chenopodium should not be given within thirty to forty-five days of each other, nor should either one of them be repeated in a shorter period of time. It is believed that a second treatment should not be given unless indicated by the finding of the eggs, larvae or the parasites in the droppings.

All foods should be withheld in these treatments an additional three or four hours after the medicine has been given.

The regulation stomach tube was used for two-year-olds and older, but a smaller tube (9/16 inch outside diameter) was found to be more practicable with the weanlings and yearlings. There is no question of the many advantages in the use of the stomach tube in giving either the carbon bisulphid or oil of chenopodium. The ease with which the stomach tube can be wrongly passed has brought this method of administering medicine to horses and colts into undeserved disrepute. In the first place, because of the anatomy of the horse's throat, it is practically necessary to insert the tube into the nostril (preferably the left one), and in the hands of the novice or the inexperienced, it is perhaps easier to push the tube into the trachea than into the gullet. If drugs for the stomach are then given they go directly to the bronchioles and lungs where a mechanical pneumonia is quickly produced and usually with serious results. The passing of the stomach tube requires knowledge of the anatomy of the horse plus experience and a correct technic; therefore, to avoid accidents, a qualified veterinarian should be employed.

While this discussion has necessarily been confined to our experiments with colts, it is desired to invite attention to the fact that age is no barrier to the parasitic invasion of horses. That parasites may and do affect the health and condition of adult horses is an established fact.

An adult horse which is not just as thrifty as his stable-mates, with coat not just as good as the others, and energy not quite so high, should be considered as a suspect—he does not have to be emaciated. Such a horse should be carefully surveyed for evi-

dences of infestation or treated on "suspicion."

Then we have the recurring colics, indigestions, etc., and the fact that they do recur indicates that we are not getting at the cause. It is believed that we have here a potential answer in the incidence of internal parasitic infestation in these cases.

SUMMARY:

1. Of the 300 animals treated, ninety per cent were found to be infested with internal parasites although they had been kept under better than average conditions.

2. Colts without characteristic manifestations of unthriftiness were found heavily infested in a large number of cases.

3. Carbon bisulphid was found to be an effective agent in the treatment for bots and ascarids, and oil of chenopodium in the treatment for Strongylus, Oxyuris, and Cylicostomes.

4. The carbon bisulphid treatment should not follow the oil of chenopodium treatment, or vice versa, within four to six weeks, and the second treatment of either only on the finding of evidence of infestation.

5. Oil of chenopodium should not be given to a mare in foal.

6. Unless special symptoms are manifested, treatment should be given in the fall of the year. Horses or colts not on pasture may be treated at any time of year.

7. The foregoing treatment is designed for horses of all breeds, and since the dosage is based largely on weight it can easily be computed.

Examination of Feces for Parasite Eggs

Where there is distinct evidence or reason to suspect that an animal is harboring intestinal parasites, a first consideration in treatment is to determine not only their presence with certainty but their kind and location as well.[70] For these conclusions in roundworm and usual flatworm parasitism of the alimentary tract we are fortunately not confined to a symptomatic evidence that is a typical and usually but little informing. Gross examination of alimentary discharges, as feces or vomit, may reveal complete or fragmented parasites which may be the direct cause of an anemic and general malnutritional condition of the host or perhaps a contributing cause to other fault. Identification of parasitic species by character of eggs revealed in fecal search assumes that the diagnostitian has a knowledge of the parasites specific to his animal; knowing the life history and habits of the species to which the eggs belong, he will know their alimentary location and what organic disturbances may be looked for in their larval migration.

The Sheather method for the examination of feces may be carried out rapidly with a very few simple utensils. The sample of feces should be of generous size, for the dog up to as much as can be heaped upon a tablespoon according to size of animal and material available. For the horse and sheep there should be at least as much as will half fill a quart Mason jar. Sufficient water is added to the sample to make a thinly fluid mixture in which the harder particles are broken up and well stirred. Formed and lumpy dog feces should have about three parts of water added to one of feces; horse feces equal parts, and sheep pellets about three parts of water to one. To remove the coarse material the mixture is strained through an ordinary flour sifter with a mesh of about thirty per inch. The fluid obtained is now poured into several ordinary test tubes or centrifuge tubes up to about one-third of their capacity. There is then added until within a half inch of the mouth of the tubes the following solution: Granulated sugar one pound, water twelve to sixteen ounces. This stock solution may be made up by immersing the vessel unstoppered in hot water, stirring at frequent intervals. Phenol or formol should be added in the proportion of one per cent as a preservative. After adding the sugar solution, gently mix it with the fecal fluid

[70] A Simple Method for Concentration of Parasitic Eggs From Feces, by B. M. Underhill; University of Pennsylvania *Bulletin*, Vol. XXIX, No. 3, October 20, 1928.

by slowly inverting each tube several times.

The tubes should now be allowed to stand without disturbing for eight to twelve hours, or, if a centrifuge is available, they may be centrifuged for a few minutes at about 1500 revolutions per minute. While standing, the eggs, being lighter than the fluid in which they are now contained, will concentrate at the top, from which they may be transferred to a microscopic slide by touching the surface with a small wooden rod, rubber tipped end of a pencil, or the tip of the fifth finger. I have found either of these better for this purpose than a glass rod. The slide, with or without cover slip, is now placed upon the stage with the microscope tube in vertical position. Low power objective should at first be used and too high an illumination avoided, as this will obscure detail.

Year Around Parasite Precautions

The folowing, from A Calendar of Livestock Parasites,[71] veterinarians should teach and preach to their farmer-stockmen clients.

Permanent pastures perpetuate parasites! Change your stock from one pasture to another, and change the kind of stock on the same pasture as far as possible. Follow shep and cattle with horses or swine.

Don't overstock. Overstocking concentrates pasture infection, resulting in more worm eggs and young worms to an area, and increases the chances of stock picking up the infection.

Use the swine-sanitation system in raising pigs. It will put money in your pocket and build up your bank account.

Put your young livestock on clean and safe areas away from older animals other than the mothers and away from areas which have been occupied by the older animals. Older animals carry parasites and diseases, and the areas occupied by them are infected. Young animals are more susceptible to trouble from these causes. Give the young animals special care and attention, as you would a baby. Most of the losses among livestock occur in young animals.

If animals are unthrifty, the trouble is probably poor breeding, poor feeding, or parasites. If it isn't the first two, suspect parasites of being the cause.

Chickens and turkeys are a bad mixture. Turkeys convey gape-worms to chickens, and chickens convey blackhead to turkeys. Raise one or the other, but not both unless you can keep them well separated.

Preventing trouble by sanitation and good farm practice is the business of the farmer. When disease is actually present it is advisable to call in a competent veterinarian and to do it early, before losses occur. It is better to sacrifice a sick lamb or chicken to find out the cause of trouble than to lose a large part of the flock.

Quarantine all new stock brought on to the place to be sure you are not introducing parasites and disease.

Burn or bury carcasses to prevent the breeding of screw worms and the transmission of dangerous parasites directly or as a result of dogs' eating the carcasses and spreading infection.

Drain or fill in the wet areas on your farm. Such places breed parasites.

Keep your dogs free from parasites, as some of the parasites that infest them are transmitted to man and livestock.

Spread manure frequently and plow it in. Don't keep it around to bred flies. In the spring, plow your old straw stacks and loose straw under, or burn them; they breed stable flies.

In the South parasites are likely to be prevalent throughout the year or to occur earlier in the year than in the North.

Send any unusual parasites to the Department of Agriculture for identification and write for advice.

Clean up your yards, corrals, stables, and all small inclosures every spring and fall, and keep the entire premises in reasonably clean and sanitary condition at all times. Parasitic diseases and other diseases flourish in dirty places. Cleanliness is profitable to the farmer and stockman.

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[71] A Calendar of Livestock Parasites, by M. C. Hall; U. S. Department of Agriculture, Miscellaneous Publication No. 25.

SHEEP DISEASES

(*Concluded from page 36*)

after several days or the animals may recover.

On post-mortem examination the most constant lesion found is an inflammation either in the fourth stomach or the small intestines, more commonly the latter. Sometimes hemorrhages are also present under the epicardium and occasionally the lymph glands may be red and swollen.

Regarding diagnosis, Newsom states that "When fat lambs are dying on full feed, showing no pneumonia and with bacterial findings negative, this condition may be diagnosed. If confirmation is desired, removal of the grain will always stop the loss."

Acidosis of Ewes

Preparturient paresis, stercoremia or autointoxication of pregnancy is a disease of ewes well advanced in pregnancy. This condition usually affects the pregnant ewe a few weeks prior to lambing.

The first noticeable symptoms are lagging behind the flock, or if in enclosures standing apart from the others, loss of appetite, nervousness and irritability, grinding of the teeth, tendency to walk in a circle or stand with the head pressed against some object in the pen. As the disease progresses the animal goes down and is unable to rise. Finally the animal passes into a complete coma, and when disturbed may be thrown into convulsions.

On autopsy there many times are practically no changes in the appearance of the tissues other than in the liver. This organ usually has a lighter color than normal, swollen and friable. The color of the liver may vary from a brownish red to almost a complete saffron; this color may be striated with reddish or reddish brown bands. In many instances small hemorrhages are found on the heart which in size and distribution resemble those found in cases of septicemias and toxemias.

This condition has responded quite satisfactorily to the use of purgatives, change and reduction of food and daily exercise. At the Kentucky Experiment Station the condition was reported to be essentially an acidosis.

Coccidiosis

The symptoms of coccidiosis are similar to those in paratyphoid dysentery and the enteric form of hemorrhagic septicemia except that a rise in temperature is not so constant in coccidiosis. Diarrhea, which may become bloody, is the first symptom noticed. If acute, great depression and loss of appetite is noticed. In the more chronic cases emaciation is pronounced. The duration of this disease is several days to possibly weeks.

On autopsy, it is found that the pathological changes are confined entirely to the intestines. In the acute type, severe enteritis, limited largely to the small intestines, is the only constant lesion. The chronic form shows light spots on the intestinal mucous membrane, even visible from the outside of the intestinal wall.

This disease is diagnosed, differentiating it from other forms of dysentry, by demonstrating miscroscopically numerous coccidia in the intestinal mucosa.

The treatment consists in the rotation of the pastures and placing the animals on a mixture of sulphur, iron sulphate, salt and linseed meal.

REPORT OF THE SECRETARY OF THE PUBLICITY COMMITTEE, EASTERN IOWA VETERINARY ASSOCIATION, OCTOBER 17, 1928

Since the appointment of the first publicity committee of this association, much has been done for the veterinary practitioner and his activities. Favorable comment has been received from many sources regarding this phase of our association's activities. Many other associations have used our methods as a pattern and the far-reaching benefit of publicity for the veterinary practitioner and the livestock industry has been extended over many regions.

From this publicity, many newspaper readers have gained a new insight of the large number of practicing veterinarians, their place in the sun in safeguarding the livestock, poultry, and pets from the ravages of disease and the health and wealth of the citizenry.

This publicity has done more than enlighten the public as to the value of veterinary service. It has caused the veterinary practitioner to take